Communications Canada
Canadian Workplace Automation Research Centre
Organizational Research Directorate

AUTOMATION AND JOBS AT CÉGEP MONTMORENCY

by
René Andrews
and
Antonin Tremblay
with assistance from
Francine Rancourt

January 1988
Laval

DOC-CWARC-DLR-86/7-015

This paper is one of a series of research reports resulting from work performed or sponsored by the Organizational Research Directorate, Canadian Workplace Automation Research Centre, Communications Canada. The views expressed in this paper are strictly those of its authors.

Copyright Minister of Supply and Services Canada 1989

Cat. No. Co28-1/18-1988E

ISBN 0-662-17033-4
(Original edition: ISBN 0-662-95053-4, CCRIT, Laval)

La version intégrale du rapport est disponible en français.
The complete report is available in French.

TABLE OF CONTENTS

CHAPTER I RESEARCH OBJECTIVES, APPROACH AND METHODOLOGY 7
1.1 Organizational Structures 10
1.2 Task Content 10
1.3 Job Evaluation 11
1.4 Compensation 12

CHAPTER II DEFINITION OF TERMS 15

CHAPTER III EDUCATIONAL SERVICES ACADEMIC SERVICES SECTOR 19
3.1 Structure and Staff 21
3.2 Mandate, Objectives and Activities 22
3.3 Automation 23
3.3.1 Sampling 23
3.3.2 Systems and Equipment 23
3.4 Impact of Automation 24
3.4.1 Organizational Structures 25
3.4.1.1 Academic Advising 25
3.4.1.2 Registrar's Office 26
a) Number of Positions 26
b) Responsibilities 26
c) Changes in Positions 26
3.4.1.3 Management 27
a) Positions 27
b) Management and Operating Methods 28
3.4.2 Task Content 28
3.4.2.1 Academic Services Assistant 29
3.4.2.2 Secretary Class II 29
3.4.2.3 Office Clerk II 30
3.4.2.4 Administrative Officer - Registrar's Office 31
3.4.2.5 Office Clerk II - Registrar's Office 31
3.4.2.6 Academic Adviser - Academic Advising 32
3.4.3 Job Evaluation 32

CHAPTER IV EDUCATIONAL SERVICES
ACADEMIC ADMINISTRATION SECTOR 35
4.1 Structure and Staff 38
4.2 Automation 38
4.3 Impact of Automation 39
4.3.1 Organizational Structure 40
4.3.2 Task Content 41
4.3.2.1 Academic Administration Assistant 41
4.3.2.2 Administrative Officer 42
4.3.2.3 Administrative Technician 42
4.3.2.4 Secretary Class II 43
4.3.2.5 Office Clerk I 44
4.3.3 Job Evaluation 45
4.3.3.1 Executives and Managers 45
4.3.3.2 Support Staff 46
a) Office Clerk I 46
b) Administrative Technician 47
c) Secretary Class II 48

CHAPTER V FINANCIAL SERVICES 51
5.1 Structure and Staff 53
5.2 Automation 54
5.3 Impact of Automation 55
5.3.1 Organizational Structure 56
5.3.1.1 Authorized Positions 56
5.3.1.2 Responsibilities 57
5.3.1.3 Changes in Positions 57
5.3.1.4 Management and Operating Methods 58
5.3.2 Task Content 58
5.3.2.1 Director of Financial Services 58
5.3.2.2 Secretary to the Director of Financial Services 59
5.3.2.3 Payroll Section 59
a) Administrative Officer 59
b) Office Clerk I 60
5.3.2.4 Accounting Section 60
a) Co-ordinator 60
b) Administrative Technician 61
c) Senior Office Clerk 61
d) Office Clerk II 62
5.3.3 Job Evaluation 62

CHAPTER VI HUMAN RESOURCES 65
6.1 Automation 68
6.2 Impact of Automation 69
6.2.1 Organizational Structure 70
6.2.1.1 Authorized Positions 70
6.2.1.2 Responsibilities 70
6.2.1.3 Changes in Positions 71
6.2.1.4 Management and Operating Methods 71
6.2.2 Task Content 72
6.2.2.1 Director of Human Resources 72
6.2.2.2 Co-ordinator 73
6.2.2.3 Secretary Class I 73
6.2.2.4 Administrative Technician 74
6.2.2.5 Secretary Class II 74
6.2.3 Job Evaluation 75
6.2.3.1 Executives and Managers 75
6.2.3.2 Support Staff 76
a) Administrative Technician 76
b) Secretary Class I 76
c) Secretary Class II 77

CHAPTER VII MAIN OBSERVATIONS, METHODOLOGY AND RESEARCH HYPOTHESES 79
7.1 Main Observations 81
7.1.1 Organizational Structures 81
7.1.1.1 Creation or Abolition of Jobs 82
7.1.1.2 Transfer of Responsibilities 82
7.1.1.3 Management and Operating Methods 83
7.1.1.4 Management Behaviour 83
7.1.1.5 Type of Organizational Structure 84
7.1.2 Task Content 84
7.1.2.1 Presentation of Data 85
a) Academic Services 85
b) Academic Administration 85
c) Financial Services 86
d) Human Resources 86
7.1.2.2 Analysis of Data 87
7.1.3 Job Evaluation 87

7.2 Climate, Approach, Methodology and Measuring Tools 90
7.2.1 Approach and Methodology 91
7.3 Research Hypothesis - Compensation 93
7.3.1 Ideal Long-term Solution 94
7.3.2 Sought-for Solution 95
7.3.3 Compromise Solution 97

APPENDIX A Organization Chart, Cégep Montmorency
- Academic Services 103
- Registrar's Office 104
- Academic Advising 105

APPENDIX B Position Description 107

APPENDIX C Analysis and Evaluation Grid
- Administrative Support Staff 111

APPENDIX D Organization Chart, Cégep Montmorency
- Academic Administration 113

APPENDIX E Organization Chart, Cégep Montmorency
- Financial Services 115

APPENDIX F Organization Chart, Cégep Montmorency
- Human Resources 117

APPENDIX G Profile by Job Cluster
- Level II Manager 119
- Level I Manager 120
- Administrative Officer 121
- Administrative Technician 122
- Secretary 123
- Office Clerk 124

APPENDIX H Technology Bonus
Alternative I 125

APPENDIX I Technology Bonus
Alternative II 127

CHAPTER I

RESEARCH OBJECTIVES, APPROACH AND METHODOLOGY

1. Research Objectives, Approach and Methodology

The prime objective of CWARC's research at Cégep* Montmorency was to determine the impact of automation on the organizational units selected as well as on jobs** within those units.

To help us attain this objective, we developed measuring tools to identify in concrete terms the duties** and tasks** affected by automation and then evaluate the impact of automation on job classification and compensation.

Consequently, we adopted a modified research approach whose major objective was not to determine whether automation has enriched or impoverished tasks in the general meaning of these terms, but rather to assess whether the impact of automation translates into an impact on the level of jobs** and employee compensation. To this end, the following four dimensions were considered:

- organizational structures**;
- task content**;
- job evaluation**;
- compensation**.

The first three dimensions were the subject of a detailed analysis for each of the departments selected. Chapters III to VI of this report contain information on each of these dimensions.

The "compensation" dimension is dealt with under avenues of research or research hypotheses in Chapter VII.

---

* Collège d'enseignement général et professionnel, postsecondary education, mandatory in Québec before entering university or leading to labor market.

** See definition in Chapter II.

1.1 Organizational Structures

Has the phenomenon of automation found expression in an impact on the type of organizational structures (horizontal, vertical, etc.)? Has automation led to the transfer of responsibilities from one organizational unit to another or within the same unit? Has automation prompted managers to be conservative vis-à-vis the creation of new positions* or the assumption of new responsibilities? Has automation affected the organization's management or operating methods?

The following methodology was used to study these variables:

- drafting of an organization chart for each department selected based on information from the managers of these departments and from Human Resources;

- analysis of organization charts and drafting of interview guides;

- semi-structured interviews with managers responsible for the departments concerned and validation of organization charts;

- analysis of organization charts on the basis of previously defined variables.

1.2 Task Content*

The content of tasks is the key element of this study, since the measuring tools developed must be precise in order to accurately determine the impact of automation on the level of jobs and employee compensation.

The impact of automation was measured by means of a job description* adapted for the purposes of research on automation. This job description enabled us to identify in concrete terms the new duties

---

* See definition in Chapter II.

created by automation and the specific tasks within each duty that were altered by automation. This job description was validated, as far as possible, by the employee and his supervisor or the responsible manager.

This measuring tool enables us not only to determine the overall impact of automation on a job in terms of percentage of time for duties and tasks, but also provides specific information on the accomplishment of those duties and tasks for which an employee is responsible. A case in point is that of an Office Clerk II whose position has been 40% affected by automation, including 20% due to creation of a new duty generated by computerization and 20% by the performance of tasks affected by computerization.

1.3 Job Evaluation

Does the impact of automation translate into an impact on jobs? To answer this question, the following methodology was used:

- analysis of the jobs* or positions selected;
- evaluation of these jobs in relation to the classification plans* in effect for the job categories* or groups* involved (support staff, non-teaching professionals, executives and managers);
- compliance with the specific application principles defined in collective agreements and classification plans;
- compliance with generally recognized basic principles of job analysis and evaluation.

---

* See definition in Chapter II.

Going back to the example of the Office Clerk II mentioned in 1.2, whose position is 40% affected by computerization, evaluation of this position took the following course:

- study of the support staff classification plan, the final version of which was adopted in December 1986;

- reference to the classification rules provided for in the appropriate collective agreement;

- specific evaluation of this position according to the rules set out in the agreements, the principles of application of the plan and the basic principles of job evaluation;

- determination of the level of the position or job on the basis of the above-mentioned criteria.

At this stage, we feel it is essential to advise those interested of the need to interpret the observations made in the specific context of a study and to avoid generalizations. The jobs selected must be evaluated in relation to the classification plans in effect in the organization within which the study is conducted. The impact of automation on the level of jobs may vary considerably depending on the job evaluation systems used. The position of Office Clerk II mentioned above could remain an Office Clerk II position under a ranking or level determinant classification system, whereas the level might be changed under a point-rating system.

1.4 Compensation

The evaluation of jobs and determination of pay scales are governed by totally different processes. Job classification plans are developed by the employer, after consultation with union bargaining units or employee associations, whereas pay scales are determined following negotiation.

Where automation has an impact on the content of tasks but not on the level of jobs, should we adopt means of compensation to encourage the use of computers and enhance productivity? Should these means of compensation be the same for professionals, executives, managers and support staff? The observations made on the basis of job evaluations guided our considerations on this subject. This aspect of the question will be dealt with fully in Chapter VII, "Main Observations, Methodology and Research Hypotheses".

CHAPTER II

DEFINITION OF TERMS

2. Definition of Terms

In this study, a number of terms were given specific meanings. The following definitions are intended to help the reader understand Chapters I to VII more easily and accurately.

Classification plan — Document used to determine the relative value of jobs for a job category or cluster.

Compensation — Pay scales negotiated by management and union to determine the wages for a job.

Duty — A separate, recognizable work activity specific to a position or job.

Job — A single position or several positions which, being essentially similar and adequately described by a single job description, are grouped together and are usually the subject of a single classification decision.
E.g.: Academic Adviser

Job analysis — Collection and systematic analysis of data concerning the responsibilities, duties and tasks of a job as well as the job specifications and qualifications required.

Job category — Grouping of jobs characterized by the nature of the duties performed and the extent of schooling required.

Job cluster — Subdivision of a job category including jobs with common features.
E.g.: - Academic Dean
- Administrative Assistant

Job description — Description of the work performed in the context of a job. Usually includes identification of the position(s) involved, summary of duties setting out the role and purpose of the job, list of duties specifying the tasks carried out and percentage of time devoted to each of the duties, as well as job specifications or qualifications required.

Job evaluation — Process to determine the level of a job by means of a classification plan.

Job level — Reflects a classification decision to determine the relative value of jobs within a job cluster.
E.g.: - Office Aid
- Office Clerk I
- Office Clerk II
- Senior Office Clerk

Organizational structures — Configuration of authorized employee population, relationships and hierarchical levels which define an administrative structure and decision-making authority.

Position — A set of duties, tasks and responsibilities which may fall to an individual.

Task — Activity component which, when combined with other components, specifies the accomplishment of a duty.

Task content — Systematic analysis of each task of a job in order to identify automation and non-automated tasks.

CHAPTER III

EDUCATIONAL SERVICES
ACADEMIC SERVICES SECTOR

3. Educational Services - Academic Services Sector

Educational Services consists of four organizational units commonly called "sectors" and identified as follows:

- Continuing Education;
- Pedagogical Development, Research and Teaching Resources;
- Academic Administration;
- Academic Services.

The Academic Administration and Academic Services sectors were chosen to be part of the study conducted at Cégep Montmorency. This section of the research report deals specifically with the Academic Services sector, in particular with its two organizational components: the Registrar's Office, and Academic Advising.

3.1 Structure and Staff

The Academic Services sector is headed by an Academic Services Assistant reporting directly to the Director of Educational Services. This sector has two sections: the Registrar's Office and Academic Advising.

The Academic Services Assistant is assisted by an Administrative Officer, who co-ordinates the activities of the Registrar's Office. As for Academic Advising, all employees report directly to the Academic Services Assistant.

The Academic Services sector has 15 employees in all, including eight assigned to Academic Advising and four working in the Registrar's Office. At the time of the study, one Secretary and one Office Clerk assisted the Academic Services Assistant in the performance of his duties.

3.2 Mandate, Objectives and Activities

The primary mandate of Academic Advising is to help students define, plan and achieve their learning objectives. To fulfil this mandate, the objectives and activities have been defined as follows:

- to inform potential candidates of program offerings and admit students likely to be successful in their studies;
- to offer academic and vocational guidance and information services;
- to inform students of academic regulations and apply them;
- to help students program their academic profile;
- to help students acquire the necessary study skills and intervene with clients experiencing learning problems;
- to conduct research in order to better understand problems and identify solutions.

As for the Registrar's Office, its main challenges involve the registration and admission of students in the regular and Continuing Education sectors. The Registrar's Office also handles the following activities:

- updating of student files;
- examination and course scheduling;
- final marks;
- certification of studies;
- transmittal of data.

3.3 Automation

3.3.1 Sampling

The Academic Services sector was chosen for this study not only for reasons of research methodology and verification of hypotheses, but also for the following reasons:

- the Registrar's Office was one of the first departments to automatize its operation;

- the Registrar's Office went from a batch computerized management system to an interactive system in June 1984;

- the Registrar's Office took part in a pilot project to introduce a new version of the GPC (college academic management) system;

- both sections in this sector are in direct contact with the College's clientele.

3.3.2 Systems and Equipment

The Academic Services sector uses the following systems to carry out its operations:

a) GPC - College academic management. This collective system contains 400 programs. The Registrar's Office is the College's main user of this system;

b) CHOIX - System of references/academic documents. This system is used by Academic Advising;

c) GLC - College space management. In-house system containing 60 programs used by all College departments;

d) SIGDEC - College staff management information system;

e) SRAM - Summer course distance registration system;

f) THESEE - Québec Department of Education collective system used for student scheduling;

g) SPOC - Information system on personnel in college organizations.

At the time of the study, six Academic Advising employees were using Lanpar terminals and a microcomputer, while the Registrar's Office had one microcomputer and five terminals (four Burroughs and one Lanpar).

3.4 Impact of Automation

This subsection deals with the impact of automation on the organizational structure of the Academic Services sector, the content of tasks and evaluation of jobs.

The information needed to evaluate impact on the organizational structure was collected through analysis of the organization chart and a semi-structured interview with the manager responsible. Additional information was provided by Human Resources.

The impact on the content of tasks was measured by means of job descriptions drafted by the Academic Services Assistant together with each incumbent. The format of the job description, adapted for research on automation, enabled us to clearly identify the new duties created by automation as well as the specific tasks within each duty that were altered by the advent of computers. Additional information was collected where required from the manager responsible and the incumbents of the positions in question.

To identify the impact of automation on the evaluation of jobs, we conducted a thorough analysis of the descriptions of each of the positions selected. These positions were evaluated with respect to the existing

classification plans for the job categories in question (support staff, non-teaching professionals, executives and managers). Generally recognized basic principles of job analysis and evaluation as well as the specific application principles of each plan were followed to the letter.

3.4.1 Organizational Structures

3.4.1.1 Academic Advising

As shown in the organization chart reproduced in Appendix A, the section has a horizontal structure. Unlike the Registrar's Office, there is no supervisory position to direct the activities of this section, and all employees report directly to the Academic Services Assistant.

The findings of the study show that automation has had little impact on the organizational structure of Academic Advising. The number of positions in the section has remained the same, and no change attributable to automation was discovered in terms of responsibilities transferred to other sections or departments, or vice versa, or in terms of activities for which the section is responsible.

The only visible impact concerns the modus operandi of Academic Advisers, with the duties of the six employees having been modified slightly. The incumbents of these positions receive more information on student files via the GPC system. Academic Advisers do not query the data bank directly, since it is the Registrar's Office that provides them with information from the data bank.

These observations for Academic Advising are not surprising: this section is not very computerized, and the prime role of its professionals is to provide direct assistance to students.

3.4.1.2 Registrar's Office

The Registrar's Office is directed by an Administrative Officer who co-ordinates the work activities of three Office Clerks. It should be noted that this section was directly affected by work automation since going from a batch computerized management system to an interactive system in June 1984.

a) Number of Positions

In the past few years, no positions have been abolished or created. But it is interesting to note that one of these four positions has been modified and that automation was given as the cause. The position is that of Administrative Officer, and further information will be provided on this subject in (c) below.

b) Responsibilities

Another effect of automation on this highly computerized section's organizational structure is the responsibility for managing data on students, which lay largely with Continuing Education and now lies wholly with the Registrar's Office. We learned in our interviews that this responsibility had been entrusted to the Registrar's Office for reasons of organization and management; having a data base managed by two different departments proved to be inefficient and the Registrar's Office, which had developed new computerized systems, showed itself capable of taking on this responsibility.

c) Changes in Positions

The addition of the responsibility for management of data on students was, according to management, the factor which led to the position being converted from Administrative Technician to Administrative Officer. In our opinion, to justify converting a Technician position into an Administrative Officer position, a number of basic conditions must obtain, such as greater freedom of action and decision-

making authority with respect to the co-ordination of activities. Generally speaking, several factors may warrant such a change, but there is often one main cause. In this particular case, analysis of the situation points firmly to automation as the main cause of the conversion, for the following reasons:

a) this section converted to an interactive system in June 1984;

b) the position was reclassified as Administrative Officer in September 1985;

c) in the meanwhile, the management of Continuing Education student files was entrusted to the Registrar's Office;

d) the incumbent of the position is responsible for a highly automated section;

e) this hypothesis is confirmed by an analysis of the content of the tasks of this position and of the three Office Clerk positions under its supervision.

3.4.1.3 Management

In addition to managing Academic Advising and the Registrar's Office, the Academic Services Assistant is assisted in his duties by a Secretary and an Office Clerk II.

a) Positions

The number of positions has remained the same, but the Administrative Technician position was converted to Office Clerk II. Our analysis, based on information from Human Resources and a review of the file, shows that the position was indeed converted and not abolished.

b) Management and Operating Methods

The management and operating methods of the Academic Services sector were greatly affected by automation, which entailed a major change in the duties of the manager responsible (Academic Services Assistant). Paradoxically, the Secretary position was little affected, but this is a temporary situation since a number of its duties and tasks are in the process of being automated.

The question of responsibilities was covered in the preceding subchapters dealing with Academic Advising and the Registrar's Office. These sections are managed by the Academic Services Assistant.

3.4.2 Task Content

This subchapter deals with the duties and tasks which were changed by the advent of new technology. Changes were evaluated using job descriptions and analysis grids prepared for the purpose. Appendixes B and C provide an example of the type of job description and analysis grid used.

All Academic Services positions were chosen, except for two Academic Advising support staff positions. For Academic Adviser positions, a standard job description was drafted in order to provide an overview of the duties and responsibilities involved in this type of job cluster.

It should be noted that to evaluate the impact of automation on the content of tasks, we chose to adopt a modified approach consisting of twinning researchers' research methodology with the work methods used by human resources specialists.

Semi-structured interviews with the managers responsible allowed us to obtain information on the overall impact of automation for each of the positions. The job description format adapted for research on automation enabled us to obtain the following data:

a) a concrete assessment of the extent to which each position has been automated;

b) identification of the new duties created by automation;

c) precise identification of the tasks where automation is used as a support.

3.4.2.1 Academic Services Assistant

The incumbent of the Academic Services Assistant position manages the Academic Services sector, which includes the highly automated Registrar's Office and the Academic Advising section, where little use is made of automation.

The interview and job description show that automation is used as a support in 42% of the Academic Services Assistant's work. The "designing master schedule" duty, to which the incumbent devotes 20% of his time, is fully automated, while computer is a support in his other duties (student registration, management of analysis and certification grids, etc.).

This phenomenon is very interesting for research on work automation since it shows the direct impact of automation on a management position in the education field whose incumbent manages a largely computerized sector and makes direct use of computers.

3.4.2.2 Secretary Class II

The incumbent acts as Secretary to the Academic Services Assistant. The manager told us during the interview that there is little automation in this position, and the job description confirmed that it involves only 10% (recording diploma numbers in the GPC system, reserving rooms, data capture for the master schedule, and label printing requests).

It should, however, be noted that this position is being gradually automated. It was considered advantageous to automatize other tasks first, including those requiring the use of a word processor rather than a typewriter.

3.4.2.3 Office Clerk II

This position has seen several changes over the years, primarily for reasons of management, operational constraints and human resource use. Analysis of the files shows that this position presents a technical profile, modified as a typical Office Clerk, and subsequently focused on duties and tasks related to automation.

The incumbent uses automation 47% of her time for her duties and tasks. Position analysis enables us to identify two different kinds of impact (this aspect is analysed in greater detail with respect to the three Office Clerk II positions in the Registrar's Office):

- the first kind of impact involves the use of computers as a tool to perform certain tasks whose rationale has not been changed;

- the second kind of impact shows a direct effect of automation: this involves computer-related tasks which have been decentralized from Computer Services to the Registrar's Office and were formerly carried out by Computer Aids. These tasks concern the capture and processing of data which require specific qualifications and are in addition to the duties and tasks normally falling to an Office Clerk II.

It is also interesting to note that before the signing of the last agreement, the pay range for the Computer Aid job cluster was higher than for Office Clerk II's. Detailed explanations are given on this subject in Chapter VII.

3.4.2.4 Administrative Officer, Registrar's Office

The Administrative Officer is responsible for organizing and monitoring the current activities of the Registrar's Office. In our view, automation is the main reason why this position was converted from Administrative Technician to Administrative Officer. We learned from the interview that this position is highly automated, and the job description confirms that 72% of the work involves using automation.

The incumbent's personal qualifications and skills in the data processing field were such that management gave her additional responsibilities and duties which justified reclassifying this position as an officer position with a higher salary.

3.4.2.5 Office Clerk II, Registrar's Office

A single job description was drafted for these three positions, since the duties and tasks to be performed or carried out are identical. The only distinction lies in the percentage of time allocated to certain duties, which varies from one position to another. These positions are 40-50% affected by automation.

Special attention was paid to these three positions, since a number of these computerized tasks were decentralized from Computer Services to the Registrar's Office. These tasks account for 30%, 15% and 30% respectively.

Tasks previously performed by Computer Aids account for 30%, 15% and 30% of the tasks now carried out by the incumbents of these positions, although prior to the signing of the collective agreement the pay range of Computer Aids was higher than that of Office Clerk II's. This phenomenon was also observed for the Office Clerk II position dealt with above, except that in this case the percentage of time devoted to this type of task was lower (10%).

This situation was the subject of a detailed analysis which so aroused our interest that hypotheses were developed concerning compensation. The concept of compensation and the principles stated in terms of hypotheses are dealt with in Chapter VII, which covers the main observations, methodology and research hypotheses.

3.4.2.6 Academic Adviser, Academic Advising

A standard job description was drafted for the six Academic Adviser positions in order to paint a picture of the duties and responsibilities normally performed by this job cluster, which is covered by the classification plan for non-teaching professionals.

These employees occasionally use the CHOIX computer system for their consultation services, as well as the GPC system for changing students' schedules. The impact of automation on the nature of tasks is minimal, and this phenomenon is easily explained by the personal assistance with which the Academic Adviser provides students.

3.4.3 Job Evaluation

The main objective of this aspect of research was to determine whether the impact of automation actually translates into an impact on the evaluation of jobs and the systems used in this regard.

To this end, we set up an evaluation committee which analysed and evaluated each of the positions selected according to the current classification plans. The methodology and measuring tools used to evaluate the impact on the content of tasks enabled us to collect specific data that are useful and satisfactory. We also wishes to take our research a little further to measure the impact in terms of job evaluation and compensation.

The conclusions of our study for the Academic Services sector show that while there was major impact on tasks for several positions, this phenomenon had no effect on the evaluation of jobs. This does not, however, mean that our conclusion might not be different if the existing systems used other systems or methods, such as the point-rating, level determinant or Hay systems.

In our view, several factors favour this conclusion, among them the following:

a) The classification plans for support staff, non-teaching professionals and executives and managers state that: the overall main, regular tasks of the employee shall be used as a reference in determining the appropriate job class. Indeed, this is a generally recognized and accepted basic principle of job analysis and evaluation.

b) The Computer Aid job cluster no longer exists, and no cluster is directly related to word processing.

c) Adding 30-40% to the duties and tasks of an Office Clerk II does not affect the evaluation, since it essentially remains an Office Clerk II position.

d) The classification plans used refer to simple systems using such classification methods as ranking and level determination.

We wish to remind readers that these observations must be interpreted in the context of a specific study of certain positions with the current classification plans. Our conclusion could have been different if, for instance, a point-rating classification system had been used. But nothing proves that the existing classification plans fall short of the prime objective of a job evaluation system, that of determining the relative value of jobs within an organization.

CHAPTER IV

EDUCATIONAL SERVICES
ACADEMIC ADMINISTRATION SECTOR

4. Educational Services - Academic Administration Sector

The Academic Services and Academic Administration sectors are the two organizational units in Educational Services that were selected for the purposes of this study.

The Academic Administration sector has a high profile in College activities because of its direct involvement with faculty. Its main responsibilities are the following:

- selection of teachers (faculty members);
- allocation of teachers by discipline;
- development and co-ordination of policies and procedures concerning teacher absences and replacement;
- layout, allocation and reservation of teaching space and faculty offices;
- management and allocation of departmental budgets;
- co-ordination of laboratory activities and development of policies and procedures for using laboratory equipment;
- organization of probationary periods and approval of contracts and agreements;
- participation in various committees: educational management, labour relations, management plan, microcomputers, and analysis of capital requests.

4.1 Structure and Staff

The activities of the Academic Administration sector are divided between two sections: Laboratory Services, and Instructional Management Services.

The Academic Administration Assistant is assisted by a Secretary Class II, an Administrative Technician and an Administrative Officer. As shown in the organization chart in Appendix D, the Administrative Officer has a half-time position. This special situation means that the Academic Administration Assistant has to supervise the work activities of the Office Clerk and co-ordinate Laboratory Services activities when the Administrative Officer is absent.

The organization chart of the Academic Administration sector does not show the breakdown of staff for Laboratory Services, since this section was excluded from the sampling for this study.

4.2 Automation

The responsibilities of the Academic Administration Assistant and those of his immediate assistants with respect to teaching staff are the main reason why these positions were chosen for this study. But there were also other reasons for this choice, among them:

- interaction with the Quebec Department of Education and other College departments (Academic Services, Human Resources, Instructional Development and Financial Services);

- the gradual automation of Instructional Management Services, which began in September 1986 with the purchase of a microcomputer for the Secretary and continued with the acquisition of another microcomputer in March 1987 and a third in July 1987;

- confirmation of the direct impact of automation on support staff jobs as opposed to the indirect impact on the jobs of executives and managers who, even if they have no computer equipment, fulfil management functions for which computers are a major tool.

The Academic Administration sector uses three IBM-PC microcomputers with the following systems:

a) GPC - College academic management. This system is used for the STEC (College teachers' task) system as well as for forecasting and planning the number of teachers;

b) GLC - College space management. This system is used for reserving rooms, establishing computer laboratory schedules, allocating authorization codes and updating information on teaching space;

c) GFC - College financial management. Collective system for budget management used by the Academic Administration sector for the accounting of requisitions, budget projections, control and management of funds, analysis of budget balances, etc.

4.3 Impact of Automation

To evaluate the impact of automation on the organizational structure of the Academic Administration sector as well as on the content of tasks and evaluation of jobs, the methodology used was the same as for the Academic Services sector.

The approach used was thus similar, except that an additional interview was needed with the Administrative Technician and the Secretary Class II in order to obtain further information to facilitate analysis of the content of tasks and evaluation of these two positions.

4.3.1 Organizational Structure

As we mentioned earlier, Laboratory Services were excluded from the sampling. This study thus bore only on sector employees providing teaching-related administrative or instructional management services.

The Academic Administration Assistant has opted for gradual automation, which has aroused keen interest from the three employees in question and encouraged the use of microcomputers within his sector. This strategy seems to have been effective in terms of learning period and as a source of motivation for those concerned.

At this point, we wish to stress the benefits of needs-oriented strategic planning. Gradual automation, in this particular case, created a psychological climate favourable to the possession and use of one's own microcomputer.

With respect to the impact of automation on the organizational structure, we must bear in mind the context described above as well as the level of automation. Indeed, we must not lose sight of the fact that only the support staff positions have been automated.

Analysis of the relevant files and information gathered during the interview in May 1987 showed no impact on the configuration of the organizational structure. Management has carried out no reorganization attributable to automation and no positions were created or abolished owing to computerization.

With respect to the assumption of new responsibilities due to automation, we noted that responsibility for reserving rooms was transferred from Academic Services to Academic Administration, and that this event coincided with the computerization of the sector. The impact here was indirect, however, since this decision was made before the automation of the sector. Since this formal transfer of responsibilities was carried out concurrently with the development of a new automated

space reservation system by the sector, we may conclude that the impact was only secondary.

The manager responsible claims not to have been conservative with respect to the creation of new positions or the assumption of new responsibilities. Management and operating methods were partly affected because of the need to make certain adjustments for operations requiring a computer as a major tool.

4.3.2 Task Content

The impact of automation on each of the five positions mentioned below was measured by means of job descriptions drafted by the manager responsible in co-operation with the employees concerned, as well as with an analysis grid like the one in Appendix C. It was also considered essential to interview the Administrative Technician and the Secretary Class II to obtain additional information on the fulfilment of their respective duties and tasks.

4.3.2.1 Academic Administration Assistant

The incumbent of this position does not use a terminal or microcomputer in the performance of his duties. None the less, he does manage a partially automated sector in which three employees use microcomputers.

While automation has had no direct impact on the fulfilment of his duties and tasks, indirect effects were noted in terms of the assumption of certain of his management responsibilities: such as statistics on teacher workload, allocation of teachers by discipline, budget projections, space management, etc.

These indirect effects cannot be denied in a comprehensive study on automation, since the manager in question has no choice but to alter his management and operating methods to organize the work so as to attain his objectives. In this particular case, the manager has to supervise the

work activities of employees who fulfil their duties and tasks with the help of computers. How could we fail to consider this aspect of the question in a situation where these employees assist him in the performance of his duties and in the fulfilment of his responsibilities?

4.3.2.2 Administrative Officer

The incumbent of this position is responsible for monitoring the delivery of courses, managing laboratory staff and applying the policies and procedures concerning teacher absences. He holds a half-time position and does not use a terminal or microcomputer. None the less, we noted an indirect effect of automation on this position owing to his responsibility for supervision of an Office Clerk I who uses a microcomputer to carry out the following duties and tasks: updating records for absences and replacements, compilation of statistics, production of an annual report and space management.

None the less, this indirect impact is of very little significance since only 20% of this Office Clerk's work involves the use of computers and the Administrative Officer devotes only one-half of his time to supervising the clerk. The indirect impact of automation was evaluated at a mere 10%, and no direct impact was found.

4.3.2.3 Administrative Technician

This employee works under the direction of the Academic Administration Assistant and uses a microcomputer to carry out her duties 75% of the time.

Her supervisor has given her such administrative duties as administration of the sector budget and records management, as well as asking her to assist him in operational teaching-related tasks (faculty register, allocation of teachers, statistics on teacher workload, course-registration book, etc.).

A substantial increase in the use of computers was noted between April 1987, when the job description was written, and the date of the interview, July 13, 1987. This marked difference is attributable to the introduction strategy mentioned in 4.3.1, which had the effect of motivating the parties involved to make gradually greater use of computers.

Analysis of the content of tasks showed that despite 75% use of a microcomputer, the nature of duties has not changed significantly. Instead, the incumbent has used a new work tool to help her fulfil her responsibilities.

Superficial analysis of this specific case might show this to be a Computer Technician rather than an Administrative Technician position, since the incumbent uses computer equipment 75% of the time. But a detailed analysis of the content of tasks tells quite a different story, since the rationale for this position is unchanged and it remains an Administrative Technician position. This situation clearly illustrates the need to evaluate jobs once the content of tasks has been analysed.

4.3.2.4 Secretary Class II

The incumbent of this position works under the direction of the Academic Administration Assistant, but also carries out certain duties for the Administrative Officer and the Administrative Technician. This employee has used a microcomputer since September 1986.

The job description drafted in April 1987 and the interview on July 13, 1987, revealed the gradual introduction of computers, translated in our analysis into an impact of some 75% on the content of tasks. There is thus a clear parallel between this position and that of the Administrative Technician as far as overall impact and progression are concerned.

But the nature of duties and performance of tasks are different. For the Administrative Technician, we concluded that the duties had not been changed, but rather adapted to a new work tool, while with respect to this position, our analysis shows that the very nature of the duties has changed.

The first duty is, in our view, that of a Word Processing Operator and not of a Secretary. The second duty, where the incumbent performs tasks related to space management, is the responsibility not of a Secretary but of a Computer Aid. These duties are automated and account for 70% of this employee's time.

Our observations on the evaluation of this position are presented in 4.3.3 (Job Evaluation). The content of tasks for this position and for the position of Administrative Technician were dealt with in depth in order to stress the need for a detailed analysis of jobs to evaluate the impact of automation on them.

4.3.2.5 Office Clerk I

The Office Clerk I works 50% under the supervision of the Administrative Officer, who holds a half-time position. She also works 50% of the time for the Academic Administration Assistant and the other employees in the section. From March 1987 to July 1987 (when she was given her own equipment), she shared a microcomputer with the Administrative Technician.

This position is only 20% automated, and the use of the microcomputer is considered secondary; most of the duties and tasks are typical of an Office Clerk I. Our analysis of the content of tasks showed that 5% of the automated tasks were more typical of a Computer Aid.

4.3.3 Job Evaluation

After a detailed analysis of the content of tasks for each of the positions selected, a committee evaluated these positions on the basis of current classification plans.

For the Academic Administration sector, the positions of Academic Administration Assistant and Administrative Officer were evaluated on the basis of the executives' and managers' classification plan, while for the positions of Administrative Technician, Secretary Class II and Office Clerk I the evaluation was based on the support staff classification plan.

4.3.3.1 Executives and Managers

The executives' and managers' classification plan gives an overview of the duties normally carried out and the minimum qualifications required by job cluster or class. This plan contains no specific evaluation factors with elements and degrees as in more complex job evaluation systems such as the point-rating, level determinant and Hay systems.

In order to evaluate an executive or manager position, the evaluator must analyse this position, and then determine the appropriate job cluster on the basis of the overview of duties and the relevant qualifications required. The evaluator must make an overall judgment which is not rationalized by means of specific job evaluation factors.

Given that the analysis of the content of tasks for the Academic Administration Assistant and Administrative Officer positions showed no indirect impact from automation, it is not surprising that the evaluation committee considered automation to have had no impact on the level of these two positions.

The indirect impact of automation combined with the type of classification plan in effect for executives and managers are two important elements leading us to conclude that automation had no effect

on the evaluation of either the Academic Administration Assistant or the Administrative Officer position.

4.3.3.2 Support Staff

The classification plan for support staff includes the following job categories: administrative support, technical support and manual support. These categories are subdivided into subcategories, job clusters and job classes.

In order to evaluate a support position, the evaluator must refer to examples or "benchmark positions", which give an overview of the nature of the work, qualifications required and features of each job cluster or class. The principles for application of this plan are similar to those of the executives' and managers' classification plan, since the evaluator must make an overall judgment by comparing the position evaluated with the definitions given in the job clusters.

For the job evaluation specialist, the operation of the system and the process followed are one and the same. The only significant distinction lies in the addition of features which illustrate in greater detail the type of duties and tasks carried out by the incumbents of these job clusters or classes.

a) Office Clerk I

Analysis of the content of tasks of the Office Clerk I showed us that this position was 20% directly affected by automation. A more detailed analysis revealed that for 15% of the automated tasks, computers were used as a major tool and the nature of the duties matched the duties normally performed by an Office Clerk I. As for the other automated tasks (5%), even if in their opinion these are tasks associated with a Computer Aid, the evaluation committee had no choice but to classify these tasks as Office Clerk II for the following reasons:

- according to the principles of application of the support staff classification plan, job clusters or classes are assigned according to the classification rules set out in collective agreements;

- the collective agreements specify that an employee whose job class matches that of a Computer Aid is included in the Office Clerk II job class.

We should mention that this position would have been classified Office Clerk I anyway, despite the existence of a Computer Aid job class, as the evaluator has to classify a position on the basis of the employee's overall main, regular tasks. This additional information is presented in the perspective of the statements of principles developed in Chapter VII of this report.

b) Administrative Technician

The incumbent of this position uses a microcomputer 75% of the time. In this case, the computer equipment is a tool enabling her to better fulfil the responsibilities entrusted to her by the Academic Administration Assistant. It helps her carry out her duties and tasks in the areas of records management, financial resources and academic administration.

Given this position's high degree of automation, one might think it is a Computer Technician position. To illustrate why this position was not so classified, we give below the definition of the nature of a Computer Technician's work as specified in the classification plan:

> "The main, regular role of employees in this class is to develop all kinds of programs for the processing of data by computer from systems whose general framework is pre-established."

Whereas the nature of an Administrative Technician's work is as follows:

> "The main, regular role of this job cluster consists in carrying out various types of technical work of an administrative nature, particularly in areas related to the management of financial and material resources and academic administration."

Analysis of the content of tasks and evaluation of this position prove, to our mind, the need for a detailed, in-depth analysis of jobs in order to measure the concrete impact of computerization. Following a superficial or generic analysis, this position would have been classified Computer Technician, whereas in fact it remains an Administrative Technician position, even though computers are used some 75% of the time.

c) Secretary Class II

Analysis of the content of tasks showed that the Secretary Class II position was 75% automated. The following observations were made following detailed analysis of the automated duties and tasks:

- 5% of the automated tasks involves regular Secretary Class II work where computers are used as a major tool.

- Duty 1 concerns memorandums, 95% of which are processed from handwritten notes. This duty accounts for 30% of the time. In a number of public and private sector agencies, there are "word processing operator" job clusters or occupational groups for this type of duty. But according to the support staff classification plan, there is no specific job cluster where incumbents perform such duties and tasks. This type of duty and task is more part of the work normally performed by a Secretary or even an Office Clerk. Consequently, this duty was classified as Secretary II.

- Duty 2 involves space management, and the incumbent spends some 30% of her time on this. Several tasks are related to the work of a Computer Aid or Office Clerk II according to the existing plan, whereas another large portion of the tasks under this duty is normally part of a Secretary Class II's work where computers are used as a major tool.

The overall evaluation shows that this position is properly classified as Secretary Class II, since the duties and tasks match this job cluster overall.

There is a similarity between this position and that of the Administrative Technician in terms of the gradual automation and the overall percentage of automated duties and tasks, which stands at about 75%.

At the specific level, the effects of automation differ, but this distinction is not sufficient to change the position's classification level. In our opinion, this position contains interesting elements to which special attention should be paid in any review of the classification plan taking the automation aspect into account.

CHAPTER V

FINANCIAL SERVICES

5. Financial Services

The Director of Financial Services reports directly to the Director General of the College, as do the Director of Human Resources, Director of Educational Services, Director of Plant and Facilities and Director of Student Affairs.

Financial Services is responsible for preparing and controlling the College's $24-million budget, 75% of which is for the payroll. It also prepares financial statements and the annual financial report which has to be certified by an accounting firm before being sent to the Department of Education. Among its more specific duties and responsibilities are the following:

- control of financial commitments and validation of accounting entries for the Payroll sector;
- control of receipts and disbursements;
- development of internal audit and control procedures;
- authorization of purchase requisitions for goods and services;
- establishment of collection procedures and mechanisms;
- control of banking operations;
- co-ordination of budgets to departments;
- performance of financial analysis and accounting operations.

5.1 Structure and Staff

Financial Services work activities are divided between two sections: Payroll and Accounting. The Payroll Section is managed by an Administrative Officer, assisted by an Office Clerk I, while the

Accounting Section is headed by a Co-ordinator, who oversees the work activities of an Office Clerk II, an Administrative Technician and a Senior Office Clerk. The Director of Financial Services is also assisted in his duties by a Secretary Class I.

5.2 Automation

Financial Services was selected for this study for the following reasons:

- this department is one of the most highly automated of the College's administrative departments;

- the eight employees in the department all have a terminal or microcomputer;

- this department underwent some major changes after a new computerized payroll system was adopted;

- this new system should entail major changes in employees' tasks.

There are two computer systems of which major use is made, according to Financial Services staff:

a) GFC - College financial management. Collective system containing 100 programs used for managing budgets and for purchases for the college and services.

b) PPC - Payroll/personnel system. Another collective system, containing 200 programs. This new interactive system is used jointly with Human Resources to process payroll and related accounting operations.

In addition to these two systems, employees use the following systems in the performance of their duties and responsibilities:

a) GPC - College academic management. This system is used for co-operation with the Registrar's Office, which is the main user.

b) GAC - Sports and recreational activity management. In-house system used for recording registrations for non-academic activities requiring action from Financial Services.

c) GLC - College space management. In-house system used for reserving rooms.

d) CLP - Product financial management. In-house subsystem of the GFC system, allows for accounting of expenditures for common products (pencils, paper, etc.).

e) SGD - Records management system. Used by all departments for records management, including classification and cataloguing of documents.

Financial Services went on to computers in 1981, but a batch system was involved. The changeover to an interactive system occurred in early 1984 with the GFC system. All department employees now have microcomputers, except for two who were given terminals.

5.3 Impact of Automation

This subchapter deals with the impact of automation on the organizational structure of Financial Services, the content of tasks and evaluation of jobs for each of the positions analysed and evaluated.

The information needed to evaluate the impact of automation on the organizational structure was collected through analysis of the organization chart and a semi-structured interview with the departmental

director. Other details were obtained as necessary, either by Human Resources or by the Co-ordinator and the Administrative Officer.

The impact on the content of tasks was measured by means of job descriptions drafted by an analyst following interviews with each employee. The job descriptions were then discussed with each incumbent and their supervisor, and validated by the supervisors. As with the other departments, the format used was that of the job description adapted for research on automation, which identified the new duties created by automation as well as the tasks within each duty where computers were used as a major tool.

With respect to the impact on job evaluation, all the positions were analysed and evaluated, with the exception of one which was vacant at the time of the study and was excluded from the sampling. The approach used, procedure adopted and basic principles established are the same as those mentioned above.

5.3.1 Organizational Structure

As may be seen in the organization chart in Appendix E, this department has eight authorized positions, all of them automated.

The Director of Financial Services, who has held this position with the College for nine years, provided valuable assistance in sketching the background of this department and supplying information on the variables used.

5.3.1.1 Authorized Positions

No positions have been cut or added in recent years, although the workload increased considerably. According to management, this increase in activity in every area without adding staff was made possible by the advent of computers. Management admits to having been conservative since it was well aware that automation would offset this increase in work activity. They even admitted that the number of authorized

positions was lower than in other colleges with the same number of students and faculty, and that this success was largely due to automation.

5.3.1.2 Responsibilities

Pragmatically, there is a significant difference between the formal transfer of responsibilities from one department to another and the sharing and assumption of responsibilities between departments. This was the perspective chosen for this study with respect to Financial Services, since concrete steps have been taken by managers in this regard. Below are certain observations of which automation is the main cause.

a) Within the strict meaning of the word, no transfer of responsibilities from Financial Services to other departments was carried out. No responsibility for a program or major work activity was formally transferred.

b) Automation was the reason for frequent discussions between the Director of Financial Services and the Director of Human Resources and between the co-ordinators of the two departments. These discussions concerned the sharing and assumption of responsibilities and duties with respect to administration of the payroll system.

c) Financial Services has begun gradually decentralizing budget management activities to the departments, and this phase of activity decentralization is in progress.

5.3.1.3 Changes in Positions

The position of Co-ordinator of Financial Services was converted from a professional to a managerial position in December 1984. Automation coincided with this reclassification and, in management's view, was to a large extent (50-70%) the cause. This is a cause with a highly significant indirect effect, as this position, according to management, has become an indispensable component for the department.

Another position change involving a reclassification was seen during the automation phase: the position of Administrative Officer was reclassified from Administrative Technician in January 1985. Our analysis shows, however, that automation was not the reason for this reclassification, since this position was computerized after January 1985. Indeed, we checked this aspect with Human Resources, who confirmed that this decision had been taken following a request from management, based on human resource management considerations.

5.3.1.4 Management and Operating Methods

The massive use of computers in both sections of this department plays a prime role in the department's management practices. The decentralization of budget activities and payroll processing are concrete examples of areas where automation has been the major cause of change.

5.3.2 Task Content

This subchapter provides an overview of the percentage of automation for each of the positions selected. In some cases, we have also highlighted the direct or indirect impact of automation.

5.3.2.1 Director of Financial Services

The incumbent of this position directs a department where computers are used intensively by a number of his employees. This aspect of the question is important; the Director does not use a microcomputer for most of his tasks, but his decisions entail the use of computers by his employees.

This is a common phenomenon in executive or management positions of all levels. Analysis of the content of tasks shows that in this case computers are used 20% of the time. In our view, for this type of position, it would be wrong to consider only this 20% in making an overall evaluation of the impact of automation on the content of tasks. To obtain

a realistic picture of the situation, we must also consider the indirect impact of automation on the content of tasks.

To back this statement, we would mention that in this particular case two of the major concerns of this manager at the time of our study were computer-related: using computers to process payroll, and administering the budget which has been decentralized to the departments. How then could we consider that this position is 20% affected? This question prompted us to develop another measuring tool for analysing the content of tasks for executive and management positions.

5.3.2.2 Secretary to the Director of Financial Services

The incumbent of this position uses an IBM-PC type microcomputer for the following tasks: word processing, invoicing of printing and purchasing expenses, creation of "customer numbers", production of invoices, processing of data for cheques received, and processing of the current accounts report. This position is 13% automated.

5.3.2.3 Payroll Section

a) Administrative Officer

According to management projections in late May 1987, the position of Administrative Officer responsible for Payroll would be affected about 30%. But the job description drafted in late July 1987 shows an impact of some 50%.

This discrepancy may be explained by the gradual automation of the payroll system. In late May 1987, this automation phase was in its initial stages, whereas barely two months later it was moving ahead fast.

Analysis of the content of tasks leads us to believe that automation will continue to have major impact on this position. It would, however, be interesting to perform another analysis of this position in July 1988, in

order to see how the situation develops. Our analysis of the content of tasks also shows that the rationale behind the duties of this position has not changed despite an impact of some 50%, since computers are used as a major tool. The performance of tasks differs with the use of a new work tool, but essentially the responsibilities, duties and tasks of the incumbent are focused on the same objectives as before.

b) Office Clerk I

This employee works under the supervision of the Administrative Officer. According to the May 1987 projections, this position should be 20% affected, whereas the job description drafted in July 1987 shows an impact of some 58%.

This discrepancy seems logical to us, as this employee works for the Administrative Officer where the same situation was observed. It would be desirable for these two Payroll Section positions to be reviewed together in July 1988 to see how their profile has evolved.

5.3.2.4 Accounting Section

a) Co-ordinator

In addition to his duties as manager of the Accounting Section, the Co-ordinator of Financial Services represents his department with Computer Services and replaces the Director of Financial Services in the latter's absence.

For the past three years, the incumbent of this position has used an IBM type microcomputer which gives him access to all the automated systems, including the Burroughs terminal, the College's main system. He also has a MacIntosh computer because of his dealings with the Department of Education for carrying out certain duties. This second microcomputer is also used for needs studies.

Analysis of the content of tasks showed that this position was 42% affected by automation, whereas in the May 1987 interview the projection had been 50%. In short, the job description confirmed these forecasts, since we noted an indirect impact of automation within four duties. This indirect impact may be explained by his work as co-ordinator of a team whose work stations are highly automated and by the fact that he performs certain of his management duties on the Director's behalf.

b) Administrative Technician

The Administrative Technician uses an IBM-PC type microcomputer and GFC software in the performance of such tasks as: analysing certain real accounts, producing monthly reports, verifying weekly reports and forms, conveying information to College departments on expenditures made, preparing documents, establishing lists of capital accounts, issuing cheques, creating collection items, etc.

The tasks listed above illustrate the importance of the use of computers in the performance of financial administration-related duties and provide an overview of the interaction of Financial Services with the other College departments using computers for communication.

Analysis of the content of tasks showed the indirect impact of automation to be about 38%. In addition, 20% of the incumbent's time is spent co-ordinating activities performed on computers by department Office Clerks to ensure that accounting data are consistent. This latter duty involves identifying priorities, checking data input, and auditing output reports and purchase orders.

c) Senior Office Clerk

The impact of automation on this position was barely 10%. The incumbent uses a terminal to input invoice data and process certain suppliers' cheques. Perhaps greater use should be made of computers for this position in particular? We leave it to management to answer this question!

d) Office Clerk II

The position of Office Clerk II was vacant at the time of the study. So, given the difficulty of obtaining a detailed job description and performing an empirical verification, this position was excluded from the sampling.

5.3.3 Job Evaluation

Despite the major impact of automation on the content of tasks of several positions, the evaluation committee concluded that there was no change in the level of the positions evaluated. The type of classification plan used for executives and managers and for support staff is, in our opinion, the main reason for this.

We must also bear in mind the fact that, in several cases, computers are used as a major tool without any change in the rationale behind the responsibilities and duties of these positions.

The level of jobs is determined by an overall comparison of the position evaluated with benchmark descriptions by job cluster. These classification plans do not include any exact evaluation factors with defined elements and weights, as in the point-rating system, for instance, or the level determinant system, etc.

We are far from being convinced that the classification plans used do not meet the main objective of an evaluation system, that of determining the relative value of jobs within an organization. Nor are we inclined to think that these plans are unfair to employees. In our opinion, this is a complex question which a single study will not resolve. Other solutions must be considered, and recommendations to this effect are made in Chapter VII of this report.

With respect to the evaluation of jobs for Financial Services, we must conclude that automation has had no impact on the level of the positions in this department.

CHAPTER VI

HUMAN RESOURCES

6. Human Resources

Human Resources is responsible for developing and applying policies and procedures with respect to human resource or personnel management. Labour relations, hiring and personnel selection, payroll and fringe benefits are the personnel management disciplines that are particularly emphasized. Among the department's other activities are staff training, organization, classification, manpower planning and overall compensation.

All these activities are geared toward the delivery of services to customers, in this case the College's regular staff, which breaks down as follows:

- teaching staff	354
- non-teaching professionals	19
- executives and managers	27.5
- unclassified	1
- support staff	142
	543.5

The Director of Human Resources must take into account the fact that this is a teaching environment with respect to the delivery of services. Human Resources' management approach differs, depending on whether its clientele is teaching or non-teaching staff.

In order to cater efficiently and effectively to the needs of this clientele, an action manual illustrates the breakdown of responsibility by activity and subactivity. For instance, Human Resources retains responsibility for interpreting the collective agreement for teachers, but confers on Educational Services the role of consultant with respect to the settlement of internal labour relations problems with teachers.

The Director of Human Resources, who reports directly to the Director General, is assisted in his duties by a Secretary Class I, and by a Co-ordinator who supervises a Secretary Class II and an Administrative Technician.

6.1 Automation

The main reasons why we selected Human Resources for this study are the following:

- the department was in the process of introducing microcomputers, and according to the projections all the work stations were to be equipped with computer equipment;

- interaction between this department and Financial Services concerning the employee payroll system;

- its service role for College employees with two types of clientele;

- interaction with other College departments in such activities as hiring, staff relations, payroll and fringe benefits;

- its front-line role in the College's automation process. Moreover, the Director of Human Resources represented the Director General as the College's spokesman for this study project to CREST and CWARC.

At the time of interviews in late May 1987 with the Director and Co-ordinator of Human Resources, the Administrative Technician had a terminal and the Director had no computer equipment, while the other three employees were equipped with microcomputers. At that time, this department was in the introduction phase, and several months later every employee without exception had a microcomputer.

Department employees use the following computer systems in their work:

a) GRH - Human resources management
In-house system behind all human resource management activities, including management of personnel files.

b) GLC - College space management

c) SGB - Records management system

d) PPC - Payroll/personnel system
Used by Financial Services and Human Resources for processing employee payroll.

e) CANARD - Electronic mail system.

6.2 Impact of Automation

All the positions in this department were selected and used as a base for measuring the impact of automation on the content of tasks, evaluation of jobs and organizational structure.

The impact on the organizational structure was evaluated by means of information gathered in interviews in late May 1987, as well as during meetings with the Director and Co-ordinator during the following months.

The job description for the Secretary I position was drafted by an analyst and validated with this employee and her supervisor. The other four job descriptions were drafted by the manager responsible and discussed where necessary with the employees concerned.

The methodology used to measure the impact of automation on the content of tasks and for the evaluation of jobs was the same as for the other departments, including Financial Services. The observations made

following our analysis should be interpreted with caution, as this department was in the process of introducing computers during the data gathering period from May to July 1987.

6.2.1 Organizational Structure

As shown in Appendix F, Human Resources has an overall authorized complement of five positions. To these regular employees surplus employees or students are occasionally added in peak periods. This temporary addition of staff is equivalent to one 50% position on an annual basis, and this additional work is largely due to the hiring of casual employees for the College's other departments.

6.2.1.1 Authorized Positions

It is dangerous to measure the impact of automation on the number of authorized positions in a department which is in the process of automatizing. It goes without saying that in such a context our observations to the effect that no positions have been created or abolished owing to automation should be interpreted with caution.

What is interesting in this respect is the position of the manager responsible, who preferred to see the impact of automation on the jobs in his department before taking the step of submitting a request for the creation of an additional position. As we mentioned above, Human Resources has for some time hired students or surplus employees to deal with the additional workload. The manager's stand on this is evidence of conservatism based on a rational needs analysis. Automation of this department could help increase productivity, and this could mean this additional position is no longer required.

6.2.1.2 Responsibilities

At the time of the study, the Director of Human Resources anticipated a number of changes concerning the sharing of duties and responsibilities with other departments. These changes, due to

automation, would involve inputting basic data for payroll processing, as well as contracts, employee files, and sick and vacation leave banks. Automation could also contribute to more regular interaction with Academic Administration and entail a new allotment of tasks.

It is highly likely that automation will have major impact on the allocation of Human Resources' duties and responsibilities and lead to negotiations between the Director of Human Resources and the other department heads on the sharing of human resource-related tasks. Unfortunately, since the department is in the process of automatizing, we were unable to see any major concrete factors, but we were able to note a number of possibilities.

6.2.1.3 Changes in Positions

It is hard to assess changes in positions since automation had only just begun at the time of the study. The manager responsible pointed out in the interview that major changes were expected with respect to the allocation of duties and responsibilities as well as to the performance of tasks within his department, but it is too early yet to say whether these changes will involve major alterations in the jobs or positions concerned.

6.2.1.4 Management and Operating Methods

Despite the fact that this department is currently in the first phase of automation, the advent of new technology has already profoundly affected its employees' management and operating methods.

The development of the GRH (human resources management) system represents a very important new tool which will substantially affect all the department's activities. This type of human resources management system, whether or not it is automated, is the foundation for the development of policies and procedures governing the hiring, selection, training and development of staff, labour relations, etc. Development of such a human resources management system is as important for this type

of department as development of an accounting system can be for Financial Services.

According to a number of department employees, automation will enable them to provide managers with improved tools to better manage their human resources. We were able to observe, even so early in the automation process, that the phenomenon has led to a better understanding of why tasks are performed. This is a harbinger of increased productivity largely brought about by the advent of new technology.

6.2.2 Task Content

The impact on the content of tasks was measured by means of job descriptions drafted for each of the five positions dealt with below, using the same methodology as for the other departments.

6.2.2.1 Director of Human Resources

It proved impossible to measure the direct impact of automation on the content of tasks of this position, since the Director of Human Resources had not yet begun to use his microcomputer when his job description was written.

As far as indirect impact is concerned, we were unable to measure it with the required accuracy, since this manager is responsible for a department in the process of automation. But some effects may be anticipated because of the service mandate of this unit, interaction with other College departments, and the fact that all department employees use computer equipment in the performance of their duties.

In our view, this position should be reviewed at a later date, and a parallel drawn with the positions of Director of Financial Services and Academic Administration Assistant, in order to study the indirect impact of automation.

6.2.2.2 Co-ordinator

The incumbent of this position organizes and co-ordinates the activities of the department with respect to payroll preparation, handles the management of fringe benefits, hires casual staff, produces certain documents required for the administration of collective agreements, participates in the non-teaching professional labour relations committee, and supervises the Secretary Class II and the Administrative Technician.

In addition to these duties, the incumbent, at the time of the study, had received the mandate from her Director of developing and implementing the GRH (human resources management) system. The objective of this system is to be the foundation for all human resource management activities, including management of personnel files.

The job description for this position was drafted in July 1987, when the incumbent was devoting a large proportion of her time to the implementation of the GRH system. The impact of automation on the content of tasks was evaluated at 40%, including 30% direct impact. It would be interesting to review this position in the future to evaluate the impact of the GRH system on this employee's regular duties.

6.2.2.3 Secretary Class I

Analysis of the content of tasks showed us that this employee used a microcomputer 62% of the time. Computers have not altered the nature of her duties but are a major tool in the performance of secretarial tasks and, to some extent, Office Clerk tasks.

The microcomputer has replaced the typewriter for performing such tasks as: drafting memos, letters, reports, tables and minutes, checking and sending mail, setting agendas, reserving rooms, developing lists for hiring teachers, transmitting data for job security purposes, drafting layoff notices, creating forms, etc.

This is a typical example of an Executive Secretary position where the employee is given a new work tool. Computers may not have altered the nature of her main duties, but they have certainly had an impact on certain duties and tasks which have recently been entrusted to the employee.

It should be noted that, unlike the other Human Resources employees, this work station has been automated for several years. The only major change is in the equipment used: the terminal was replaced by a microcomputer this past year.

6.2.2.4 Administrative Technician

The incumbent of this position is responsible for carrying out administrative work concerning employees' pay, administering various fringe benefit plans, and doing administrative work for contracts and new employees' documentation.

At the time of the study, this employee was just starting the computer familiarization process, so it is not surprising that this position is only 10% affected by automation.

Given the incumbent's overall duties and responsibilities, the gradual automation process for payroll and fringe benefit services, and the joint efforts of Financial Services and Human Resources to make this process run smoothly, it is most likely that this position will be more highly automated in the months to come.

6.2.2.5 Secretary Class II

At the time of the analysis of the job description, the position of Secretary Class II was only 15% automated, but Human Resources was currently in the process of developing and implementing the GRH system. This position will probably be some 50% automated in 1988, owing to the incumbent's role in using this computer system. This employee is responsible for office activities with respect to opening employee files,

gathering the data required for teacher classification, sorting mail, co-ordinating vacation selection records, receiving visitors, and preparing meetings. This type of duty is directly related to the objectives of the GRH system, including that of personnel file management, so it seems logical to us to expect a higher percentage of automation in this position.

6.2.3 Job Evaluation

The positions of Director and Co-ordinator of Human Resources were evaluated by an evaluation committee according to the executives' and managers' classification plan following overall analysis of the content of tasks.

For the positions of Administrative Technician, Secretary I and Secretary II, the same process was followed, except of course that we used the support staff classification plan.

6.2.3.1 Executives and Managers

Evaluation of the position of Director of Human Resources was postponed to a later date for lack of information relating to automation. As the incumbent had not yet begun to use his microcomputer, we were obviously unable to identify the duties created by automation or the tasks changed by the arrival of new technology. Since such data is essential for this study, we had no choice but to take this route for the position in question.

As for the Co-ordinator position, it was 40% affected, including 30% direct impact. This significant impact on the content of tasks could have led to a re-evaluation of this position. But this possibility did not materialize, owing to the type of classification plan for executives and managers, which contains no "specific factors" for job evaluation. Indeed, detailed explanations on the application of this type of classification plan were given in Section 4.3.3.1 on Academic Administration.

6.2.3.2 Support Staff

a) Administrative Technician

This position was evaluated with no guarantee as to accuracy, as it seemed highly likely that it would be affected to a greater extent in the months to come. With a mere 10% impact from automation, it was not surprising to note that this evaluation showed no impact on the classification of this position.

b) Secretary Class I

The subsection dealing with the impact on the content of tasks showed us that the Secretary Class I position was 62% affected. It was also stated that in our view the very nature of the main duties was unchanged. Rather, it was a situation where computers were used as a major tool.

The evaluation committee did, however, note that 50% of the duties of this position were representative of a Secretary Class I position, while the other 50% were duties and tasks normally performed by a Senior Office Clerk or Office Clerk I. This situation is interesting, since it seemed to us that automation was one of the reasons why this employee was able to take on new duties and responsibilities. In short, the productivity aspect left time available for the incumbent to move away from her traditional duties as Executive Secretary to handle activities normally performed by an Office Clerk.

With respect to the actual evaluation of this position, we must refer to the principles of application of the employee classification plan, which state in particular that it is the overall main, regular tasks which must be used as a reference in determining the appropriate job class or cluster. Since Secretary Class I duties and tasks remain the major tasks in this position, it was classified Secretary Class I.

c) Secretary Class II

The results of the evaluation of this position show that 65% of the duties are representative of a Secretary Class II, while 35% are duties and tasks normally performed by an Office Clerk I.

Analysis of the content of tasks showed that this position was only 15% automated. But implementation of the GRH system could entail greater use of computers with an automation rate of some 50%. Indeed, this forecast was made by the Director of Human Resources in an interview.

The foreseeable increase in computer use along with the implementation of the GRH system could change the nature of the duties of this position. These two factors could entail a changeover of duties from the Secretary job cluster to that of Office Clerk. The present proportion of duties could even be reversed (65% for the Office Clerk and 35% for the Secretary).

It would be highly desirable to draft a new job description and subsequently to conduct a new evaluation of this position in order to ensure that this job is classified correctly.

CHAPTER VII

MAIN OBSERVATIONS, METHODOLOGY AND RESEARCH HYPOTHESES

7. Main Observations, Methodology and Research Hypotheses

This chapter gives an overview of the main observations made following the detailed study of the four selected departments. In fact, it is a summary of Chapters III to VI of this report. These observations will be presented by research aspect and by variable used for each of these aspects.

A section will deal with the methodology used and the measuring tools developed through this study at Cégep Montmorency. Finally, we will conclude by developing research hypotheses concerning that part of the study dealing with the "compensation" aspect.

As this study is part of a comprehensive research program on the impact of automation in the public and parapublic sectors, we will also state certain research hypotheses which will concern us in future empirical studies. We believe these concerns may be shared in order to try, through working together, to illuminate the debate concerning the impact of automation on organizational structures, the content of tasks, evaluation of jobs and compensation.

7.1 Main Observations

7.1.1 Organizational Structures

The variables used to evaluate the impact of automation on organizational structures were chosen for their consistency with other research aspects (task content, job evaluation and compensation). The variables selected are: type of organizational structure, creation or abolition of positions, transfer of responsibilities, management and operating methods, and management behaviour.

7.1.1.1 Creation or Abolition of Positions

None of the departments selected either created or abolished positions because of automation. It should be stressed that Cégep Montmorency management undertook to make no layoffs due to work automation. Indeed, this written undertaking appears on page 4 of the brochure on work automation published by Cégep Montmorency in June 1985. It goes without saying that this undertaking by management toward its employees contributed greatly to the calm atmosphere observed during our study.

7.1.1.2 Transfer of Responsibilities (within or away from departments)

We noted a major impact of automation on the transfer of responsibilities from one department to another, and other substantial changes are anticipated in the short term. A case in point is Academic Services, which has been given responsibility for management of student data, while Academic Administration now co-ordinates space management services.

The automation of Human Resources, particularly through the GRH computer system, may be expected to lead to significant changes. The Director of Human Resources anticipates that responsibilities will be shared with other departments in such sectors of activity as the input of data for payroll processing and contracts, as well as maintaining employees' files. Other areas will also be the subject of studies which should lead to improved sharing of tasks and enhanced interaction with the other departments.

Discussions are under way between Financial Services and Human Resources concerning the allotment of tasks and assumption of responsibilities for payroll processing. Financial Services has also undertaken a major decentralization of activities to the departments for certain aspects of accounting.

7.1.1.3 Management and Operating Methods

All department heads interviewed told us automation had altered their management and operating methods. In some cases, the automation phenomenon literally forced managers to learn more about why a task is performed. This factor alone is a major contribution to healthy management within an organization.

Several department heads took advantage of this opportunity to make adjustments to their operations and streamline the use of certain systems. Since the management and operating methods have proven to be most relevant, more specific elements will be introduced in future studies to deal with it in greater detail.

7.1.1.4 Management Behaviour (Conservatism)

The objective of this variable was to find out management's behaviour or reaction to the creation of new positions or the assumption of new responsibilities due to automation.

Our study revealed that the managers responsible for operational sectors showed no signs of conservatism, whereas the departmental directors deliberately delayed submitting requests for additional positions. It therefore appears that automation could increase productivity within Financial Services and Human Resources and contribute to better use of resources.

It goes without saying that a single study cannot identify trends with respect to the automation phenomenon, but it can open avenues of research for other empirical studies.

7.1.1.5 Type of Organizational Structure

Several empirical studies have shown that in the private sector automation caused a flattening-out of structures due to the elimination of several middle management positions. According to our hypothesis, there is a significant difference between the private and public sectors, and this situation is so important that the number of middle management positions will remain virtually unchanged since these employees will be streamlined and assigned to other duties.

The study conducted at Cégep Montmorency showed no significant impact on the configuration of organizational structures. The managers responsible for the departments selected have not changed their organizational structure because of automation. While the new technology has not prompted department heads to alter the composition of their departments' structure, an impact was observed with respect to the conversion of technician or professional positions into management positions.

In the Academic Services sector, one technician position was reclassified as Administrative Officer, while in Financial Services one professional position became a Co-ordinator. In both cases, automation was the main reason for these changes.

This situation tends to confirm our hypothesis that automation does not reduce the number of middle managers in the public sector.

7.1.2 Task Content

To illustrate the impact of automation on the content of tasks, we present data on each of the positions analysed. These data, collected by department, give the titles of positions and the estimated percentage of automation for each one. Appendix G contains diagrams illustrating the automation profile by job cluster.

7.1.2.1 Presentation of Data

a) Academic Services	(Percentage of Automation)
Academic Services Assistant	42%
Administrative Officer	72%
Secretary Class II	10%
Office Clerk Class II	47%
Office Clerk Class II (3 positions)	50% 40% 50%
Academic Adviser (6 positions)	20%
b) Academic Administration	
- Academic Administration Assistant*	- - -
- Administrative Officer (indirect impact)	10%
- Administrative Technician	75%
- Secretary Class II	75%
- Office Clerk Class I	20%

* Had no computer equipment at the time of our analysis.

c) Financial Services

- Director	20%
- Administrative Officer	50%
- Co-ordinator	42%
- Administrative Technician	38%
- Senior Office Clerk	10%
- Secretary Class I	13%
- Office Clerk Class I	58%

d) Human Resources

- Director*	- - -
- Co-ordinator	40%
- Administrative Technician	10%
- Secretary Class I	62%
- Secretary Class II	15%

Note: The percentage specified shows no indirect impact from automation for most executive or manager positions.

---

* Had no computer equipment at the time of our analysis.

7.1.2.2 Analysis of Data

For the category of executives and managers, the diagrams presented in Appendix G and the previous data show us that:

- Level I Managers and the Academic Administration Assistant use computers directly at most 20% of the time;

- with the exception of the Academic Services Assistant, these managers have developed a temporary dependence on their Co-ordinators or Administrative Officers;

- except in the case of the Administrative Officer for Academic Administration, all Co-ordinators or Administrative Officers make extensive use of computers (40-72%).

The percentage of computer use for Administrative Technicians varies according to the departments' operational requirements. It should be noted that an increase in computer use by the Administrative Technician for Academic Administration offsets the low level of use by the department head responsible and his Administrative Assistant.

With respect to Office Clerks, these positions are 40-50% automated. As for Secretaries, the degree of automation varies from 10 to 15%, except for the Secretary to the Director of Human Resources (62%) and the Secretary of Academic Administration (75%).

The profile of use by department exhibits the same trends, except for Academic Administration, where the most highly automated work stations are those in the support staff category.

7.1.3 Job Evaluation

The evaluation committee analysed and evaluated 30 positions in the four departments selected.

The study of the impact on organizational structures and the analysis of the content of tasks served as a springboard for gaining a clear understanding of the activities of each of the departments and of the authorized positions within these departments. This approach was considered an essential prelude to the analysis and evaluation of jobs.

All the positions were evaluated with respect to existing classification plans for the job categories and clusters in question. The principles of application specific to each of these plans as defined in the collective agreements were followed, as were the relevant classification plans. Generally recognized basic principles of job analysis and evaluation were also followed.

The evaluation committee concluded that automation had no impact on the positions selected, despite the fact that there had been major impact on the content of tasks of several of these positions. To this general conclusion on the evaluation of jobs, we wish to add the following observations:

a) It was specified above that automation was the factor which triggered the conversion of the technician position into an Administrative Officer position for the Academic Services sector, while for Financial Services automation was the main reason for the reclassification of a professional position as a Level II Manager. We wish to stress that these observations were made during the analysis of files and are not the result of an evaluation of these positions by this study's evaluation committee. The committee evaluated these two positions and confirmed that they were indeed Administrative Officer and Co-ordinator positions.

b) All these positions were analysed and evaluated on the basis of information gathered during the study. The situation could be different if the study were conducted now or at a later date.

c) We also stressed the likelihood of changes in the content of tasks of certain positions in order to warn management of the possibility that a review of certain positions may be necessary. These are situations where the analysis and evaluation were conducted while automation was taking place gradually. Cases in point are the positions of Secretary in Human Resources and Secretary Class II in Academic Services.

Our hypothesis is that the impact of automation for the "evaluation of jobs" aspect varies according to the different types of classification plans. Our overall objective is to evaluate the impact by job cluster for the majority of recognized job evaluation systems. This method will enable us to use the data gathered to prepare a strategic planning model.

Our observations for this study show no impact from automation on the classification plans of support staff, executives and managers, or non-teaching professionals. The principles of application of these plans basically rely on a system of level determinants containing no specific evaluation factors with elements and degrees.

For purposes of illustration, we could establish a parallel between the Office Clerk job cluster for colleges and the Office Clerk occupational group in the federal public service. The duties and tasks falling to the incumbents of both groups are essentially similar.

To evaluate an Office Clerk position in a college in relation to the support staff classification plan, the evaluator must make an overall judgment by comparing the position with benchmark positions that give an overview of the nature of the work, typical features and qualifications required. Evaluation of an Office Clerk position in the federal public service must be performed by granting a point rating for each of the following evaluation factors: knowledge, complexity, consequence of errors, contacts and supervision.

Since point boundaries are predetermined for each level in this occupational group, automation could possibly affect a position lying within a few points of the minimum or maximum of a given level. This is a far cry from the situation where the evaluator has to make an overall judgment considering a system of level determinants like the College's. This explains why the level of certain positions has not been changed although the content of tasks was much affected by automation. This comparison of two systems also enables us to rationalize our hypothesis that the impact of automation may vary according to the job evaluation systems used.

After these explanations, we might tend to believe that colleges should adopt a point-rating system in order to take the computerization phenomenon into account. But before undertaking such a drastic change, a number of basic aspects must be considered:

- automation is not an end in itself, but one factor among many which may be the subject of considerations for the development or alteration of a job evaluation system;

- the main objective of a job evaluation system is to determine the relative value of jobs within an organization;

- development of a job evaluation system must take into account the needs and special features of an organization. In our view, there is no ideal system that may be applied unilaterally. The best system is the one which proves to be the fairest and which takes an organization's peculiarities and features into account.

7.2 Climate, Approach, Methodology and Measuring Tools

We believe that sharing and disseminating knowledge can be the key factor in advancing the cause of automation. We wish to make our modest contribution by providing explanations on the approach adopted, methodology used and measuring tools developed in the course of this

study. We invite anyone interested to share their comments with us so that we can make any corrections that may be necessary.

We also wish to take this opportunity to thank Cégep Montmorency management, union stewards and staff for their assistance. Their devotion and understanding allowed us to work in a work climate favourable to our research. Conducting a study focusing on jobs requires the active participation of the parties involved, and managers and employees contributed gracefully.

This opening also prompts us to stress the major factors which have contributed to the harmonious implementation of automation:

- publication of a brochure on work automation setting out an organizational policy on work automation, an information policy, a training policy, information management and development of a work plan;

- creation of a work automation committee;

- management's commitment to making no layoffs or downgradings due to automation;

- active participation by employees and union stewards;

- contribution of Cégep Montmorency's Director of Human Resources and his counterpart in the Fédération des cégeps (College Federation);

- open dialogue between labour and management.

7.2.1 Approach and Methodology

The study of the impact on organizational structures and the content of tasks were used as a springboard for studying the impact on the evaluation of jobs. This latter aspect was also the motivation behind

adding the compensation aspect. In future empirical studies, we will retain these four aspects, and will add to them the criteria of hiring, recruitment, promotion and selection. For organizational structures, the variables will include additional elements, particularly those concerning management and operating methods.

The job description format adapted for research on automation very accurately measured the impact of automation on the content of tasks of support staff. This new measuring tool enabled us to clearly identify the new duties created by automation as well as the tasks within certain duties which were changed by automation. This measuring tool also fulfilled its role very well for evaluating the impact of automation on the content of tasks of employees, executives, managers and non-teaching professionals.

In future studies, we will none the less try to develop a new measuring tool to measure even more accurately the impact on the content of tasks for executives, middle and senior management and professionals. Our overall objective is to develop accurate measuring tools for each of the following job categories:

- executives;
- middle and senior management;
- professionals;
- technical staff;
- support staff.

The analysis grid in Appendix C is also intended as a new measuring tool that was developed during this study. We feel it is helpful to develop such grids by job category and, if necessary, by job cluster. In our view, it is essential to measure the impact of automation on the evaluation of jobs while taking into account the classification plans in effect within

the customer organizations. Our main objective is to clearly determine the impact by job category and cluster in order to identify trends by occupation.

The "compensation" dimension is dealt with specifically in the following section.

7.3 Research Hypotheses - Compensation

The findings of this study showed major impact on the content of tasks of a significant number of positions in the four departments selected. Major direct impact was also noted in several job clusters: Office Clerks, Secretaries, Administrative Technicians, Administrative Officers, etc. Indirect impact was also shown in a number of job clusters, among them Level I Managers.

This is therefore a general phenomenon affecting most job clusters with significant percentages of computer use going as high as 75% in some cases. But despite this phenomenon, we observed that automation had no impact on the evaluation of jobs.

These two observations prompted us to develop avenues of research focusing on the notion of productivity in relation to the "compensation" aspect of the study. If automation has major impact on the content of tasks but this impact does not translate into impact on the level of jobs, do other ways exist of encouraging the use of computers and improving productivity? Should the alternatives be the same for professionals, executives and managers, and support staff?

We wish to point out that the alternatives presented below were developed from the main observations of this empirical study. These alternatives are presented as avenues of research and should be the subject of future studies. These are ideas set out to advance the debate surrounding the automation phenomenon, and not formal recommendations binding upon the parties concerned.

The three avenues of research which will be mentioned take the following principles into account:

- identification of a source of motivation for greater use of computers in order to enhance productivity;

- development of compensation methods;

- need to acquire new skills or qualifications due to the introduction of new technology.

7.3.1 Ideal Long-term Solution

We mentioned above that automation is not an end in itself, but one important factor among many which affect the use of human resources.

Automation may affect the content of tasks of certain positions in the same way as an organizational change, for instance. It is highly desirable, even essential, in the event of a major organizational change, that the positions affected be reviewed. This exercise requires the drafting of new job descriptions with a view to the analysis and evaluation of these jobs according to existing classification standards or plans.

If this basic rule applies to organizational changes, this same rule should also be applied to changes generated by automation. The process to be followed remains the same: drafting of job descriptions for positions affected by automation, and analysis and evaluation of the jobs in question.

Theoretically, reviewing the positions is the ideal route to follow and respects the basic rule mentioned above. For practical reasons, though, it presents two major constraints:

a) development of measuring tools to evaluate accurately and equitably the impact of automation on the content of tasks;

b) review of classification standards or plans which will take the automation phenomenon into account.

As regards the first constraint, we sincerely believe it is possible to develop measuring tools in the short term to evaluate the impact of automation on the content of tasks with the required accuracy. This problem could be cleared up quite quickly by co-operation among the various parties involved.

The second constraint is a serious challenge and a complex problem. Development of a new classification standard or plan is onerous work and, in most cases, takes several years of hard, ongoing effort. This is a complex, intricate process aimed at finding long-term solutions to major problems. In most cases, this process involves in particular: developing questionnaires, selecting job evaluation factors, choosing benchmark positions, conducting several interviews, as well as job evaluation exercises, etc. In addition, since the impact of automation is likely to be felt on several job categories and groups, this process must be followed by all categories of the job cluster in question.

Development of a new classification standard or plan is an interesting way to evaluate in all fairness the impact of automation on the content of tasks. This approach respects the traditions and basic principles of job analysis and evaluation. But these are corrective measures whose prime objective is to bring long-term solutions to the problems encountered.

Are there any equitable alternatives to deal with the problem?

7.3.2 Sought-for Solution

The difficulty of accurately measuring the impact of automation on the content of tasks and the impact on the evaluation of jobs prompted the parties involved to seek other possible solutions.

The resolution of this complex problem forces the parties involved to move in several directions, including that of settlement by negotiation. The possibility of additional compensation to be permanently grafted on to existing pay scales raised both hopes and doubts.

This solution offers the advantage of leaving the field wide open to negotiation, to force the parties to reach a democratic settlement. Given the major constraints surrounding the "ideal solution" proposal mentioned above, this solution could prove to be the most practical path to follow to resolve the problem in the short and medium term.

Despite praiseworthy efforts, this "sought-for solution" was set aside on several occasions, because of the following shortcomings:

- introduction of new technology or use of computers does not affect all work stations in the same bargaining unit;

- the degree of automation varies from one work station to another;

- this solution makes no allowance for the very different processes provided for "evaluation of jobs" and "compensation" (the job evaluation process is set aside to solve a problem relating to it).

Does the sought-for solution seek to correct a temporary problem through permanent measures? Is this solution fair and equitable for all concerned and does it encourage productivity through rational use of new technology?

Despite everything, we believe this "sought-for solution" or avenue of research has many merits. Our research has prompted us to continue our consideration on this subject by trying to find a reasonable compromise between this "sought-for solution" and the "ideal solution".

We wish once again to specify that these are avenues of research that are put forward with a view to resolving a complex, knotty problem. Fear of stumbling should not override the need to express ideas.

7.3.3 Compromise Solution - Technology Bonus

We sincerely believe that the job evaluation process and the process of negotiating compensation are valid mechanisms which have proven their worth and follow established traditions. These are processed with different but converging objectives.

We feel it is incautious, even illogical, to ignore viable means of solving a technological problem. In our view, the parties involved should sit down at the table together to solve the problem in the short, medium and long term.

In our opinion, the "ideal solution" set out in 7.3.1 should provide the necessary long-term corrective measures. The job analysis and evaluation process should take its course, and efforts should be made to:

- develop measuring tools to identify new duties created by automation as well as tasks altered by the use of new technology;

- change or develop classification standards or plans taking the automation phenomenon into account.

Since this solution could solve the problem in the long term, a technology bonus could be the ideal compromise solution to:

- recognize employees' additional efforts;

- promote the use of computers and increase productivity;

- provide the parties involved with the time needed to develop processes for solving the problem in the long term in a calm atmosphere.

This technology bonus could be granted to users on a rational basis. This solution would avoid the shortcomings inherent in the second solution presented, the "sought-for solution". This solution has the advantage of temporarily solving the problem fairly and equitably in the same bargaining unit.

How would this bonus be applied? As a basic principle, this is a proportional bonus granted to users, and could be allocated annually on the basis of a lump sum negotiated by the parties. For instance, a lump sum of $1,000 maximum could be considered, allocated yearly on a proportional basis (see Appendix H). Referring to the data in 7.1.2.1, we could easily determine the amount of this technology bonus. Below are some examples for selected departments:

- Secretary Class II - Academic Services
  $1,000 X 10% = $100

- Administrative Officer - Academic Services
  $1,000 X 72% = $720

- Administrative Technician - Academic Administration
  $1,000 X 75% = $750

- Co-ordinator - Financial Services
  $1,000 X 42% = $420

- Director of Human Resources
  $1,000 X 0% = $0

These examples show the conditions of application of an annual technology bonus allocated proportionally on the basis of a negotiated lump sum of $1,000.

This technology bonus recognizes employees' efforts to acquire additional skills or qualifications over a certain period (one year). It encourages productivity through increased use of new technology while allowing long-term processes provided for an "ideal solution" to be developed.

We believe the conditions of application of this bonus to be simple, realistic and practical. A number of other conditions of application could easily be developed by the parties involved. Here, for instance, is another possibility, with stricter conditions of application (see Appendix I).

It illustrates facts observed during this study, which are behind this idea of a technology bonus. A review of the Office Clerk II positions in the Registrar's Office, mentioned in Chapter III of this report, reveals features worth highlighting:

- certain automated tasks related to data capture have been decentralized from Computer Services to the Registrar's Office;

- these tasks, previously performed by Computer Aids, have been entrusted to Office Clerk II's;

- the Computer Aids' pay range prior to the signing of the collective agreement was higher than that of the Office Clerk II's;

- on December 31, 1986, the hourly remuneration of Computer Aids was $9.63, while that of Office Clerk II's was $9.32;

- the annual remuneration of Computer Aids on December 31, 1986, was $17,526.60, while that of Office Clerk II's was $16,962.40.

The facts listed above show that these Office Clerks now perform certain tasks which commanded wages higher than their pay range. Very strict application of the technology bonus principle would thus warrant an annual lump sum of $564.20 ($17,526.60 - $16,962.40). This annual bonus

allocated on a proportional basis would yield the following results:

- $564.20 X 30% = $169.26
- $564.20 X 30% = $169.26
- $564.20 X 15% = $ 84.63

The grids in Appendixes H and I show the conditions of application of the technology bonus using both of the approaches presented.

We believe the principles and conditions of application of this technology bonus would likely match the needs of the users of new technology for administrative and technical support staff.

It seems possible that this bonus could also be given to non-teaching professional staff and executives and managers. On the level of principle, we feel it is desirable to grant a bonus for executives and professionals, but we are still wondering about its conditions of application. Executives and professionals are paid more than support staff. Is a lump sum of several hundred dollars a sufficient incentive? Would it not be preferable to opt for additional fringe benefits?

If the parties involved chose another solution in the case of non-teaching professional staff and executives and managers, it should be ensured that the principles and conditions of application do not discriminate against support staff and do not favour one group to another's detriment.

We hope these avenues of research will provide some elements of a solution to resolve the debate and advance the cause of computerization. We are fully aware that research on jobs and compensation treads on sensitive ground. This hot topic should not, however, prevent the parties involved from expressing ideas for fear of being burnt.

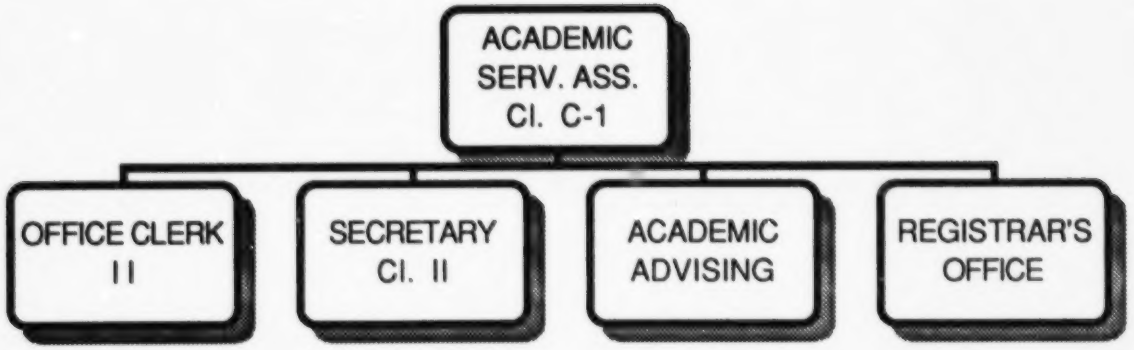
APPENDIXES

APPENDIX A

ORGANIZATION CHART

CÉGEP MONTMORENCY

Academic Services*



* Reporting to the Director of Educational Services

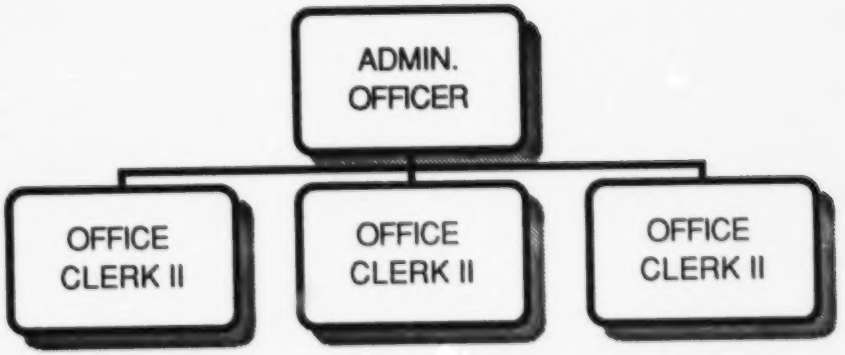
May 1987

APPENDIX A
(cont'd)

ORGANIZATION CHART

CÉGEP MONTMORENCY

Registrar's Office*



* Reporting to the Academic Services Assistant

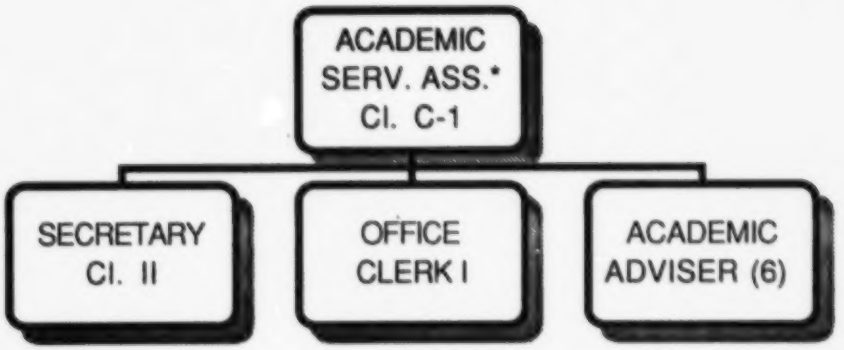
May 1987

APPENDIX A
(Cont'd)

ORGANIZATION

CÉGEP MONTMORENCY

Academic Advising



* Reporting to the Director of Educational Services

May 1987

APPENDIX B

POSITION DESCRIPTION

	Employee	Supervisor
NAME:		
POSITION TITLE:	Assistant to the Director of Educational Services (Academic Services)	Director of Educational Services
SECTOR:	Academic Services	

SUMMARY OF DUTIES

Under the direction of the Director of Educational Services, the Academic Services Assistant manages the Academic Services sector. This sector contains two sections: the Registrar's Office, and Academic Advising. In addition to this duty, the Academic Services Assistant is responsible for organizing certain operations, designing the master schedule, managing certification grids and determining course offerings. Given his training, he also acts as a resource-person in matters of development and use of data processing tools within his sector.

DUTIES

		Percentage of time
I	Direct the Registrar's Office and Academic Advising, by:	40 %

- carrying out long-term planning;
- organizing operations and putting resources in place;
- managing human resources;
- monitoring operations and evaluating their results;
- maintaining relations with the environment (other departments, faculty, students referring to the department head, parents, miscellaneous organizations, etc.).

II Organize the following operations, by: 5%

- managing course selection;
- managing schedule changes/corrections.

These operations were chosen because they involve the use of computers and direct contact with the Registrar's Office, as well as being two schedule-related operations.

III Design the master schedule, by: 20%
(regular students)

*- determining the content of basic records: rooms, teachers, descriptions of groups, etc.;

*- analysing schedule constraints;

*- designing the master schedule;

*- supervising the data capture of the master schedule;

*- checking the master schedule.

IV Register students, by: 15%
(regular students)

The final registration of students in each of their courses is the outcome of a long process beginning with students' course selection. The student scheduling system assigns each one to a group. These registrations are then loaded into the GPC data bank and checked. After schedules are returned, there is a period for schedule and thus registration taking into account changes and corrections.

*- supervising the data capture of course selection;

*- ordering course selection changes, based on different analyses, verifications and simulations;

*- analysing requests for schedule changes/corrections and performance of some of these changes;

---

* Automated duties and tasks

V Make enrolment projections, by: 5%

We need these projections to determine the number of students to be admitted by program, in order to stabilize student enrolment and teaching resources. They are also essential for Academic Administration, which is responsible for developing enrolment projections for each course.

- gathering and disseminating statistical data on enrolment;
- forecasting enrolment by program;
- determining the number of students to be admitted to each session.

VI Manage certification analysis grids, by: 5%
(regular students and Continuing Education)

- monitoring the development of courses and programs;
- drafting course grids, by program, and substitution tables;
- * recording certification grids in GPC and continually updating them so that computer analyses of students' eligibility for certificates of study may be performed.

VII Determine course offerings, by: 5%
(regular students)

This duty involves analysing student needs, development of programs, and requests from departments, in order to determine which courses will be offered the following year.

- analysing programs:
- consulting the departments and Academic Administration;
- submitting a project proposal to College management.

---

* Automated duties and tasks

VIII Organize the summer session, by: 5%

- developing course offerings based on student needs and available resources;
- performing operations leading to the hiring of teachers;
- ensuring delivery and quality of education

QUALIFICATIONS REQUIRED

I Training:

- Undergraduate University Degree.

II Experience:

- Three years' work experience in Educational Management in a College;

III Other Requirements:

- For the professional tasks in addition to the management task, training in mathematics and/or data processing is required.

SIGNATURE

Superior:	**Date:**	**Name:** _____
Immediate Supervisor:	**Date:**	**Name:** _____
Employee:	**Date:**	**Name:** _____

APPENDIX C

ANALYSIS AND EVALUATION GRID -- ADMINISTRATIVE SUPPORT STAFF

SECTION 1 : IDENTIFICATION

Employee's Name: _____
Position Title: Office Clerk I
Department: Financial Services

SECTION 2: JOB ANALYSIS

SECTION 3: QUALIFICATIONS

Education: Secondary V
Experience: 1 year, accounting and payroll
Other requirement: Aptitude for using a microcomputer

Classification: Office Clerk I
Impact of automation: 58%

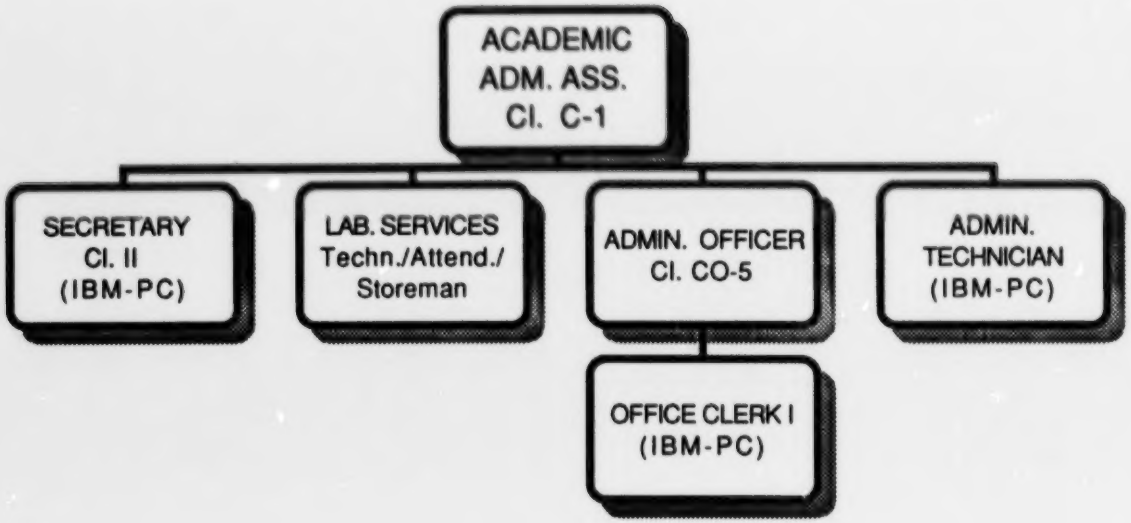
DUTIES AND PERCENTAGE	EVALUATION								AUTOMATION		
	Senior Office Clerk	Office Clerk Class I	Office Clerk Class II	Office Aid	Secr. Class I	Secr. Class II	Other	Total	Change	New duties	Non-automated tasks
1. Data entry (45%)		45%						45%		45%	
2. Register (15%)		15%						15%			15%
3. Transactions (10%)		10%						10%	5%		5%
4. Pay distribution (15%)		10%	5%					15%	5%		10%
5. Supervision (05%)		5%						5%	3%		2%
6. Related tasks (10%)		4%	6%					10%			10%
TOTAL 100%		89%	11%					100%	13%	45%	42%

APPENDIX D

ORGANIZATION CHART

CÉGEP MONTMORENCY

Academic Administration*



* Reporting to the Director of Educational Services

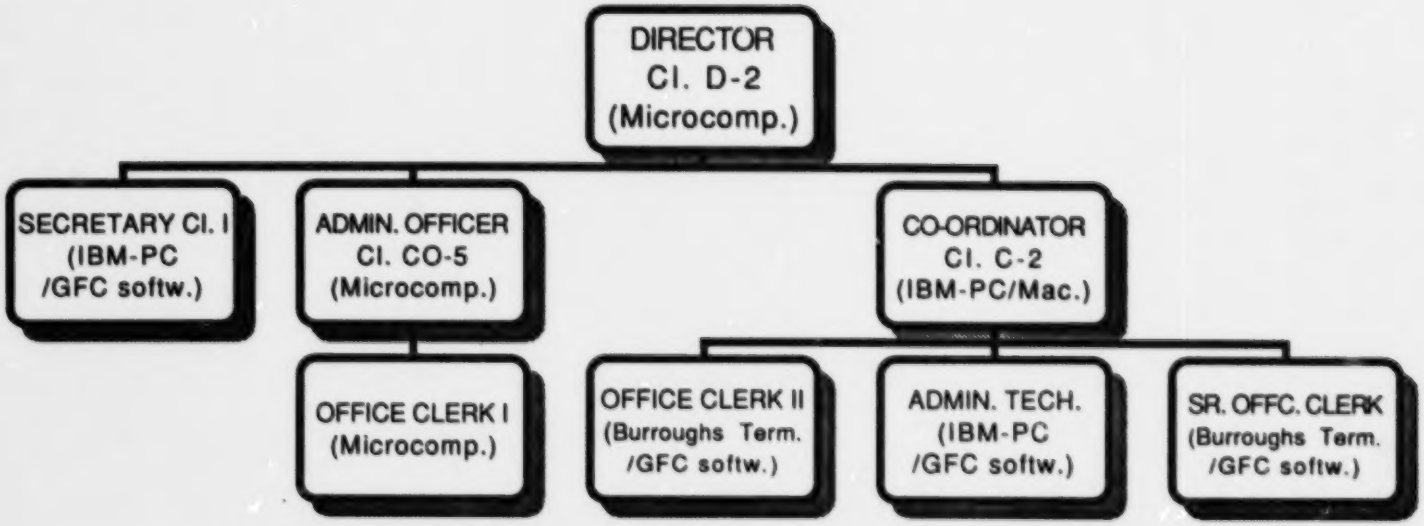
July 1987

APPENDIX E

ORGANIZATION CHART

CÉGEP MONTMORENCY

Financial Services*



* Reporting to the Director General

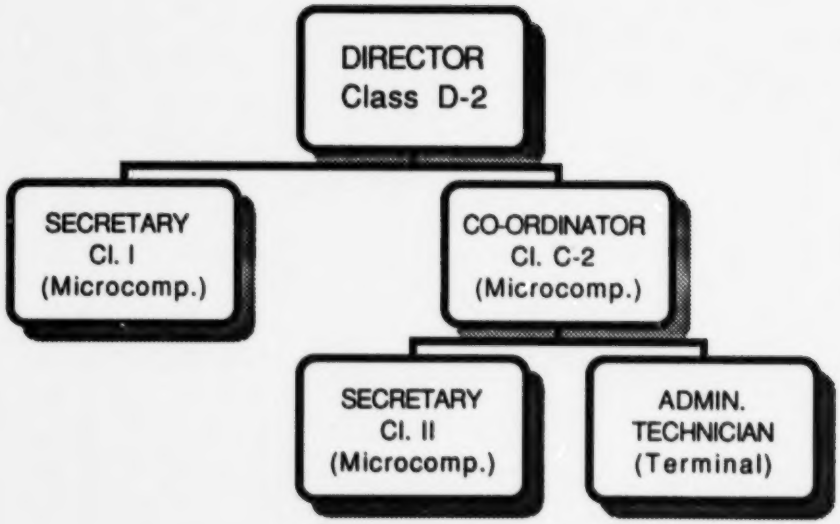
July 1987

APPENDIX F

ORGANIZATION CHART

CÉGEP MONTMORENCY

Human Resources*

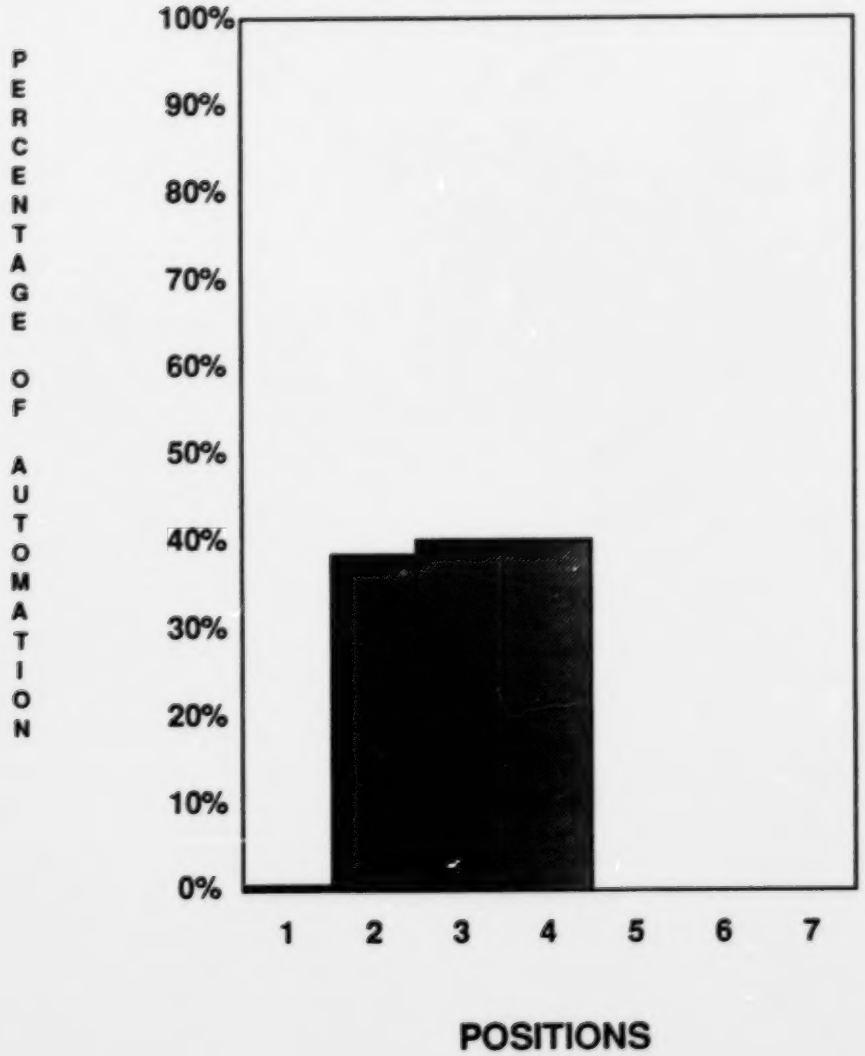


* Reporting to the Director General

APPENDIX G

PROFILE BY JOB CLUSTER
LEVEL II MANAGER

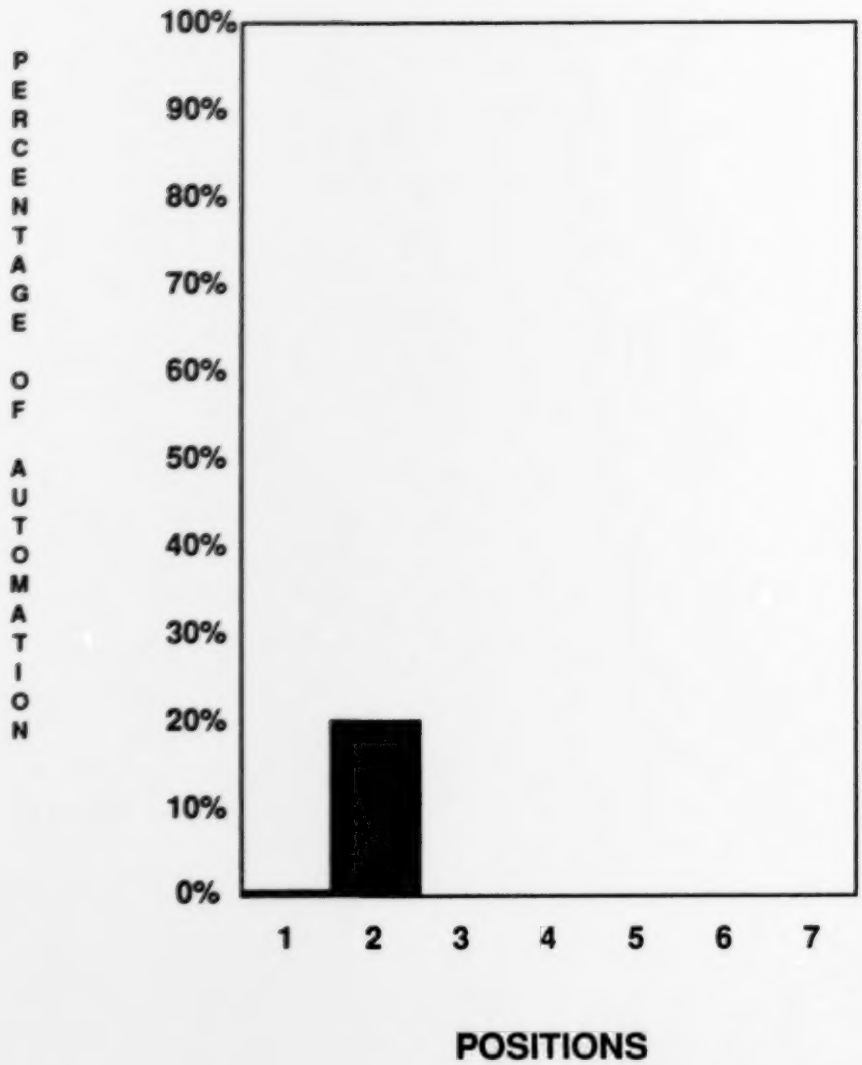
NUMBER OF POSITIONS (4)



APPENDIX G
(cont'd)

PROFILE BY JOB CLUSTER
LEVEL I MANAGER

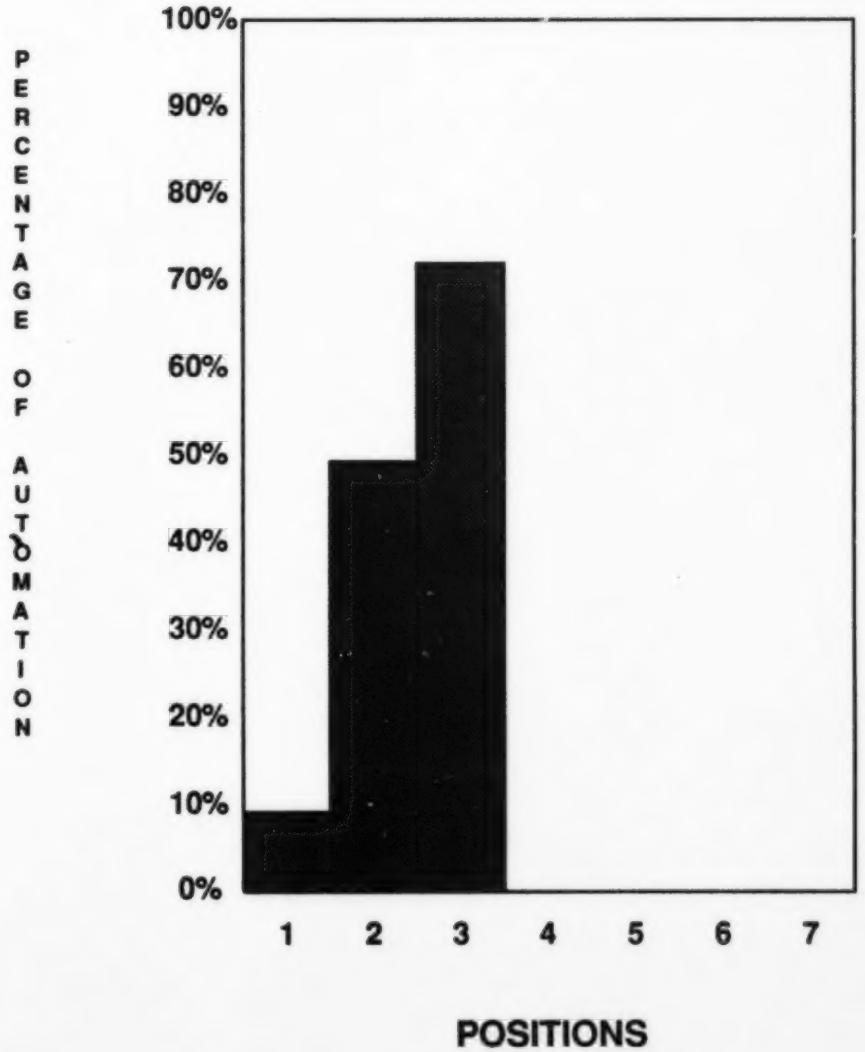
NUMBER OF POSITIONS (2)



APPENDIX G
(cont'd)

PROFILE BY JOB CLUSTER
ADMINISTRATIVE OFFICER

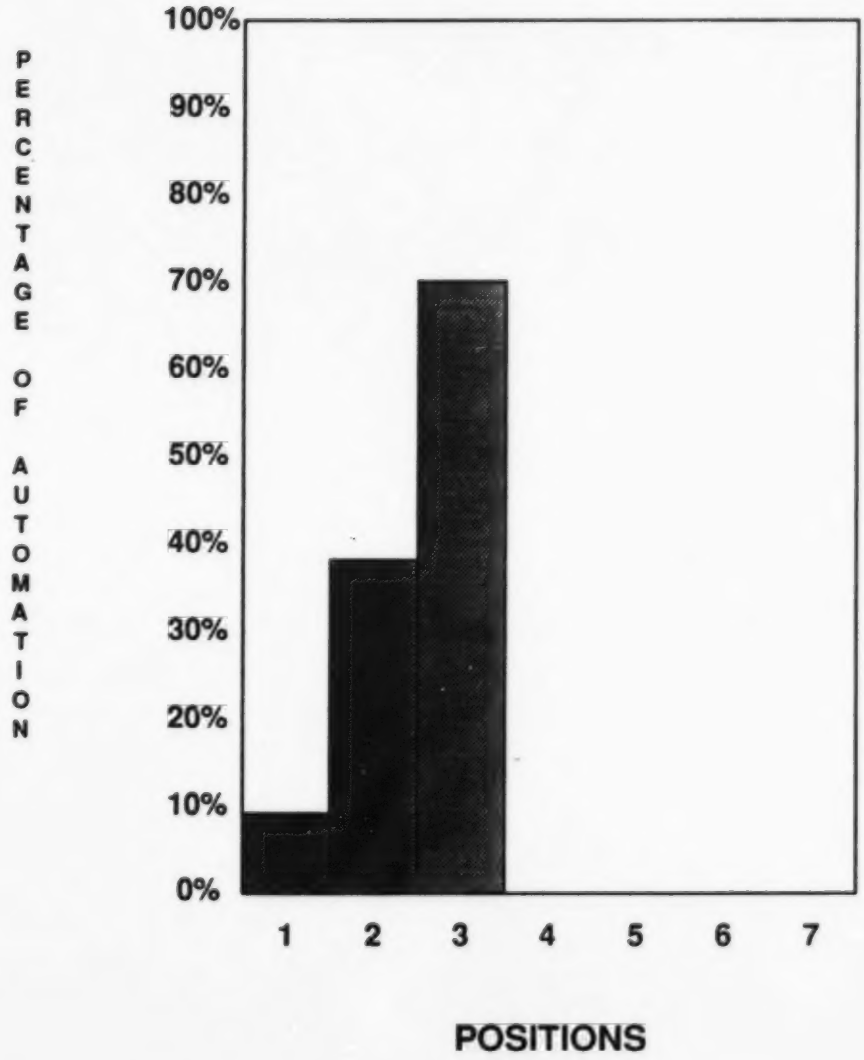
NUMBER OF POSITIONS (3)



APPENDIX G
(contd)

PROFILE BY JOB CLUSTER
ADMINISTRATIVE TECHNICIAN

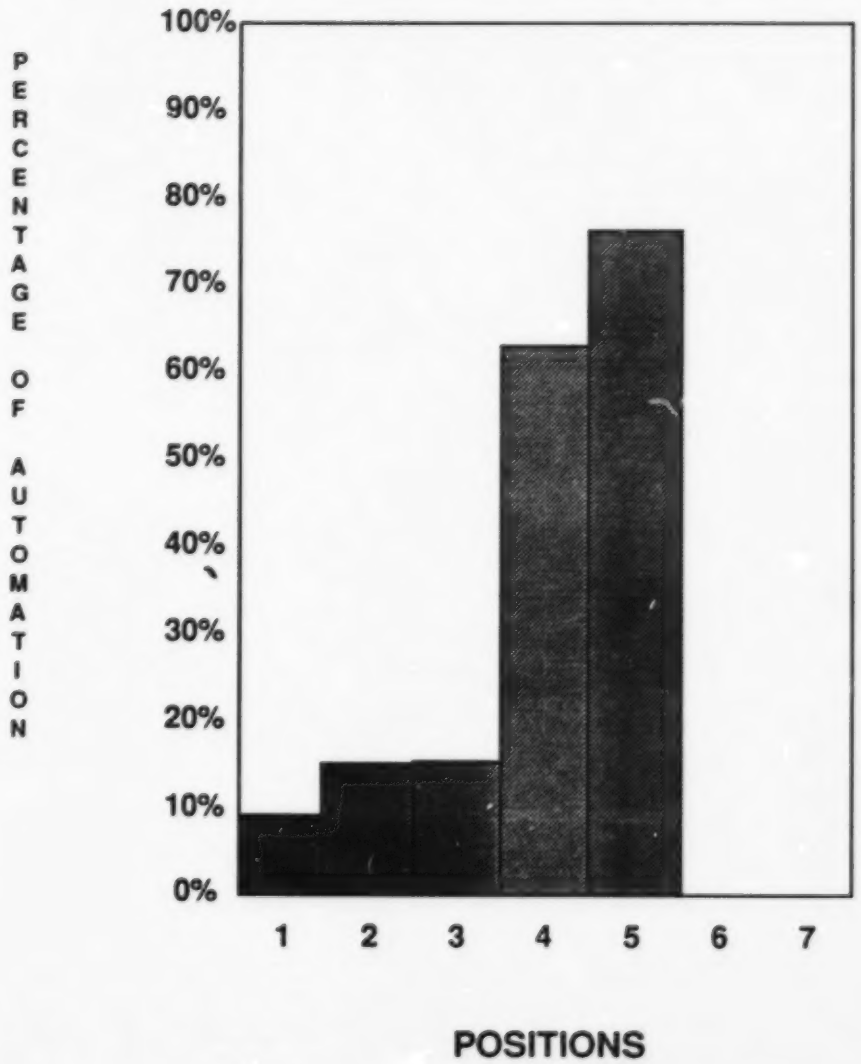
NUMBER OF POSITIONS (3)



APPENDIX G
(cont'd)

PROFILE BY JOB CLUSTER
SECRETARY

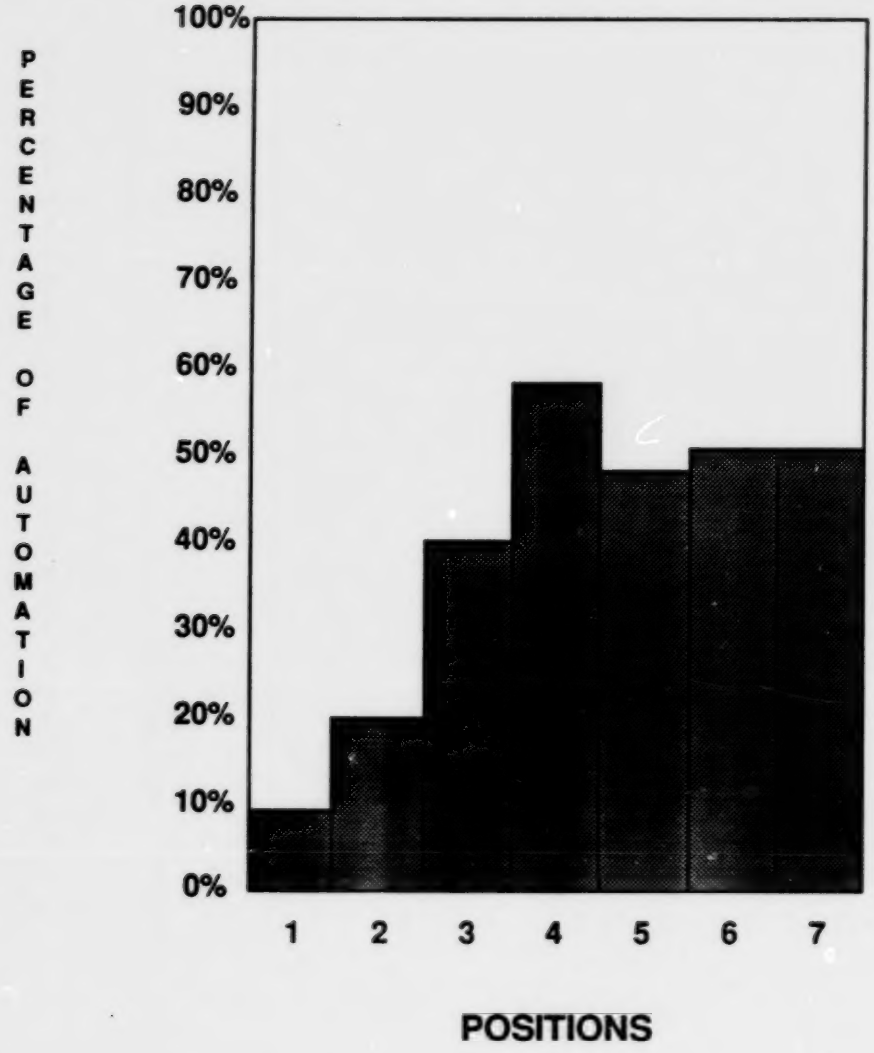
NUMBER OF POSITIONS (5)



APPENDIX G
(cont'd)

PROFILE BY JOB CLUSTER
OFFICE CLERK

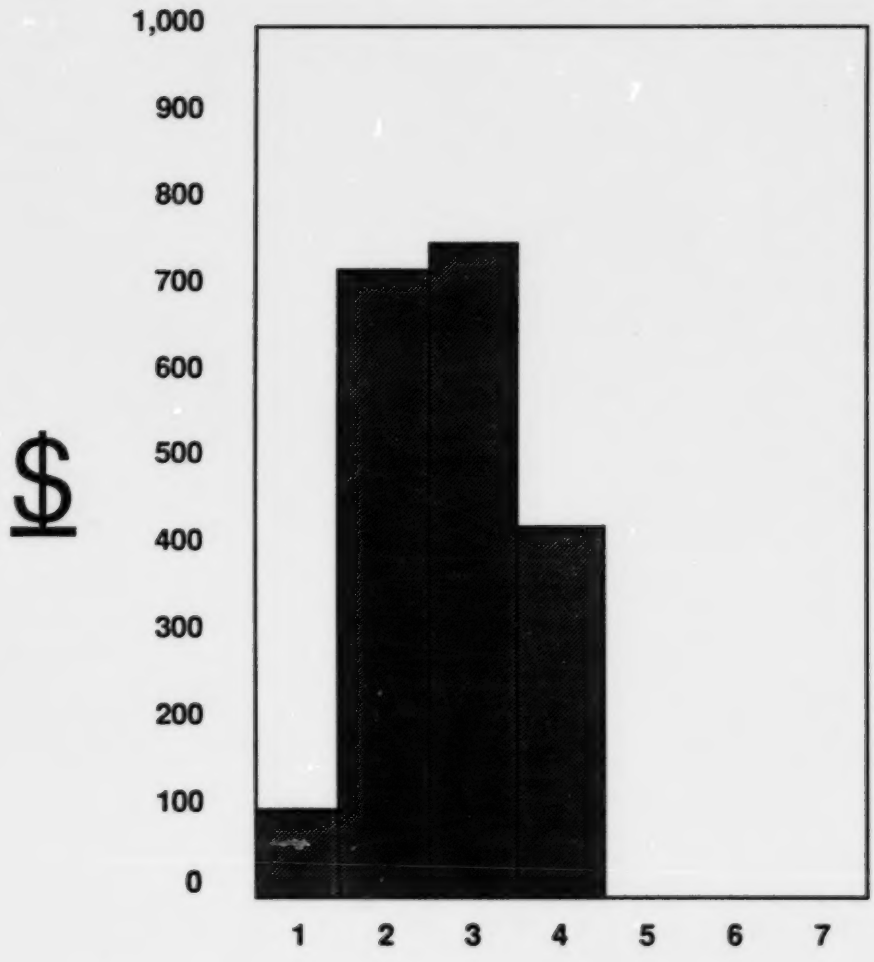
NUMBER OF POSITIONS (7)



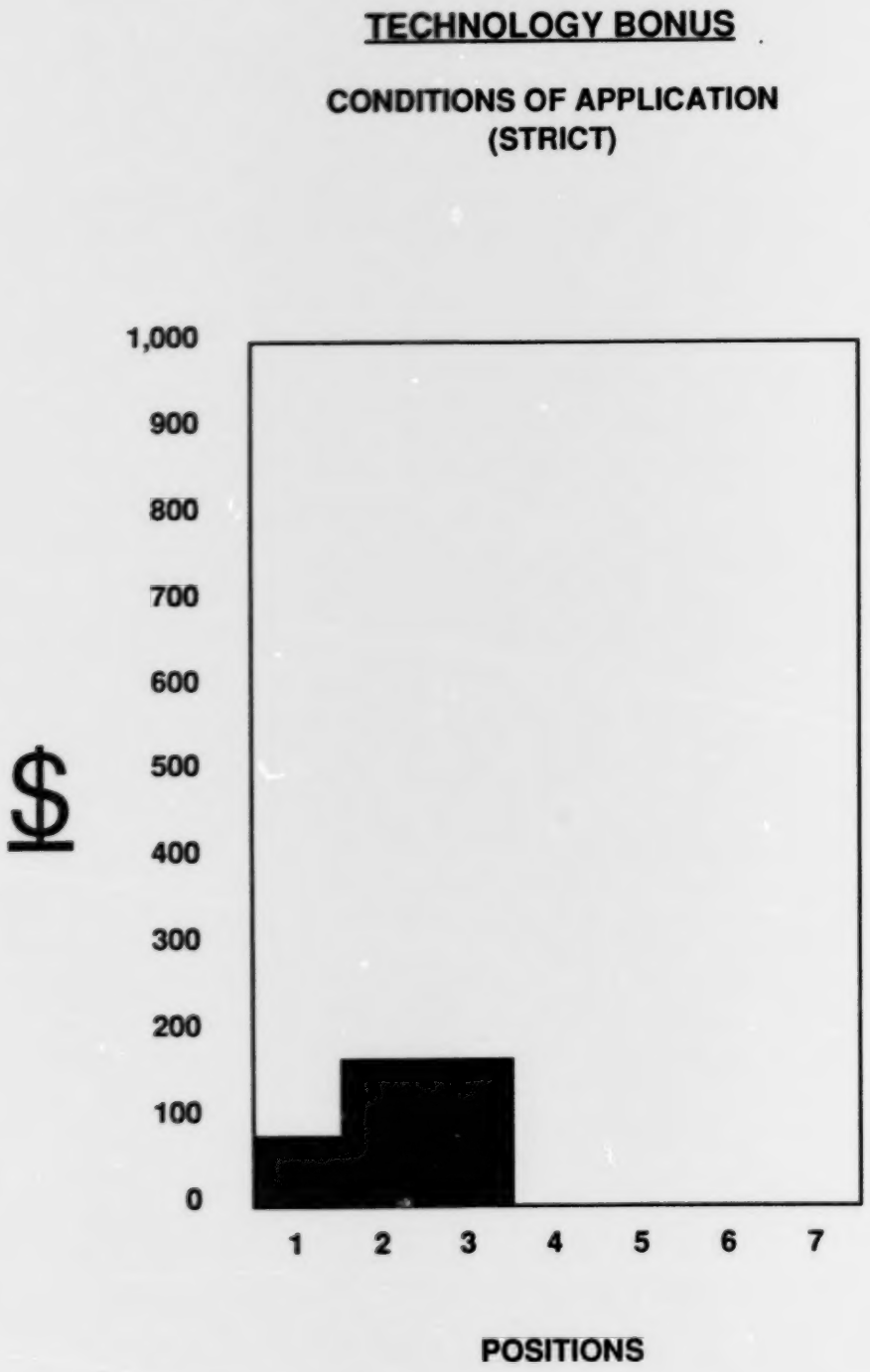
APPENDIX H

TECHNOLOGY BONUS

CONDITIONS OF APPLICATION
$1,000.00 LUMP SUM



APPENDIX I


TECHNOLOGY BONUS
CONDITIONS OF APPLICATION
(STRICT)
1,000
900
800
700
600
500
400
300
200
100
0
K$
1
2
3
4
5
6
7
POSITIONS